NS 1.22/7:988/final

NSF 435

MAY 2 5 1990

u.s. scientists and engineers: 1988

COMPLETED

u. s. scientists and engineers: 1988

surveys of science resources series
national science foundation

detailed statistical tables

NSF 90-314

Suggested Citation

National Science Foundation, U.S. Scientists and Engineers: 1988, final estimates, NSF 90-314, Detailed Statistical Tables, available in paper copy and on diskettes (Washington, D.C., 1990).

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GENERAL NOTES

The data contained in this report are a product of the National Science Foundation's (NSF's) Scientific and Technical Personnel Data System (STPDS). They represent final estimates of the employment characteristics of the Nation's scientists and engineers in 1988.

The STPDS comprises four components: three surveys and the Science and Engineering Tabulating Model (SETAB). Each of the three surveys is designed to measure the characteristics of a particular subpopulation.

- The Experienced Sample of Scientists and Engineers is the followup survey series to the 1982 Postcensal Survey of Scientists and Engineers. The Postcensal sample was drawn from respondents to the 1980 decennial census. This survey measures the magnitude and characteristics of individuals in the science and engineering (S/E) population at the time of the 1980 Census. The surveys have been conducted for the NSF by the Bureau of the Census in 1982, 1984, 1986, and 1989. The results of the 1989 survey will be available in summer 1990.

- The Survey of Natural and Social Science and Engineering Graduates is designed to measure the characteristics of those who earned degrees in S/E fields after the 1980 decennial census. The Institute for Survey Research, Temple University, conducted this survey series for NSF in 1982, 1984, 1986, and 1988 and is currently conducting the 1990 survey.

- The Survey of Doctorates Recipients focuses on the characteristics of scientists and engineers who have been granted doctorates by U.S. universities and colleges. Since 1973, this survey series has been conducted on a biennial basis for NSF by the Office of Science and Engineering Personnel, National Academy of Sciences. The most recent survey was completed in 1989 and covered individuals who received S/E between 1946 and 1988. Results will be available in summer 1990.

The data in this report were generated using the fourth component of the STPDS, the Science and Engineering Tabulating Model. This model was developed for the National Science Foundation by Mathematica Policy Research, Inc. The primary function of the model is to integrate data from the Experienced Sample and Recent Science and Engineering Graduate surveys to produce national estimates of the magnitude and characteristics of the S/E population in the United States. A secondary function of the model is generate short-term forecasts. Data in this report represent the product of both of these functions. The results of the 1988 Recent Science and Engineering Graduate survey were integrated with forecasts of the characteristics of the Experienced population (the last survey of this population was conducted in 1986).

Forecasts generated were based on the assumption that the number of scientists or engineers in a specific field may be determined from historical trends.[1] A regression model was developed that estimates S/E field numbers from (a) current and past levels of research and development funding, (b) current and past numbers of graduate students in S/E fields, (c) current and past numbers of advanced educational degrees granted in S/E fields, and (d) the general health of the national economy.

This report is divided into three sections. The technical notes in section A contain information on the concepts and definitions used in the report. The statistical tables are presented in section B. Copies of the questionnaires for the underlying survey instruments are contained in section C.

For further information on this report or others concerning the STPDS, please contact Melissa J. Lane, Scientific and Technical Personnel Studies, Division of Science Resources Studies, Room L-611, National Science Foundation, Washington, D.C. 20550, (202) 634-4664.

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[1] Myles Maxfield, Jr. and Luther Yost, Revisions to the NSF Science and Engineering Estimation Model, (Washington, D.C.: Mathematica Policy Research, Inc., April 1988), under contract to the National Science Foundation, SRS 85-05962.

SECTION A. TECHNICAL NOTES

Definition of Scientists and Engineers

The tables in this report present data on the population of scientists and engineers in the United States. Broadly speaking, a person is considered a scientist or engineer if he or she has met at least two of the following criteria:

(1) Has earned a degree in the natural sciences, social sciences, or engineering:
(2) Has been employed in S/E occupation; and/or
(3) Has professionally identified as a scientist or engineer on the basis of total education and work experience.

Definitions of Primary Characteristics

Field of Science or Engineering

Data on field of science or engineering are classified as follows:

- Physical sciences: chemistry, physics, astronomy, and other physical sciences including metallurgy

- Mathematical sciences: mathematics and statistics

- Environmental sciences: earth, atmospheric, and oceanographic sciences, including geophysics, geology, seismology, and meteorology

- Life sciences: agricultural, biological, and medical sciences (excluding those individuals primarily engaged in patient care)

- Social sciences: economics (excluding agricultural economics), sociology, anthropology, and all other social sciences

- Psychology

- Computer specialties: computer scientists, computer systems analysts, or "other" computer scientists. Computer engineers are classified as engineers. Computer programmers are not included in the classification.

- Engineering: aeronautical/astronautical, chemical, civil, electrical/electronics, industrial, materials, mechanical, mining, nuclear, petroleum, and all other engineers.

Data on field are derived from responses to questions that ask (a) educational background and field of study, (b) name of the occupation specialty most closely related to the respondent's principal employment, and (c) name of occupation specialty most closely related to the respondent's professional self-identification. Education fields and occupation specialties are chosen from lists provided with the questionnaires.

Sector of Employment

Information on type of employer is also derived from survey responses. Individuals are asked to choose the category that best describes the type of organization of their principal employment from the following list:

- Industry
- Self-employed
- Junior college, two-year college, technical institute
- Medical school
- Four-year university or college other than medical school
- Elementary or secondary school system
- Hospital or clinic
- Nonprofit organization, other than hospital, clinic, or educational institution
- U.S. military service, active duty, or Commissioned Corps
- U.S. Government, civilian employee
- State Government
- Local or other government
- Other

Primary Work Activity

Data presented on work activities of scientists and engineers relate to their primary activities. The data are derived from responses to a series of questions in the survey instruments that ask individuals (a) to specify their primary and secondary work activities and (b) to provide a percentage distribution of their work time devoted to these activities. Work activities are classified as follows:

- Management or administration of research and development
- Management or administration of other than research and development
- Teaching or training
- Basic research
- Applied research
- Development
- Report and technical writing, editing, and information

retrieval
- Clinical diagnosis, psychotherapy
- Design of equipment, processes, models
- Quality control, testing, evaluation, or inspection
- Operations: production, maintenance, construction, installation, exploration
- Distribution: sales, traffic, purchasing, customer and public relations
- Statistical work: survey work, forecasting, statistical analysis
- Consulting
- Computer applications
- Other activities

Employment Characteristics

Labor force participation rate: the labor force is defined as those employed and those seeking employment. The labor force participation rate is the ratio of the labor force to the population.

Unemployment rate: the unemployment rate shows the ratio of those who are unemployed but seeking employment to the total labor force.

Statistical Reliability

Estimates of scientists and engineers are derived from sample surveys and thus are subject to both sampling and non-sampling error.

Sampling Errors

Since these estimates integrate results of multiple surveys, standard errors have been generated using the Method of Random Groups. This technique is appropriate when the survey sampling structure is sufficiently complex that normal, analytically-derived estimation formulas become unmanageable. Approximate sampling errors for national estimates, as well as those for the Experienced Sample survey and the Recent Science and Engineering Graduate survey, may be obtained by contacting the Scientific and Technical Personnel Studies Group, Division of Science Resources Studies (see page v for address information).

Nonsampling Errors

Nonsampling errors may be attributed to many sources: inability to obtain information about all cases; definitional difficulties; differences in the interpretation of questions; respondents' inability or unwillingness to provide correct information; mistakes in recording and coding the information; and other errors in collection, response, processing, coverage, and imputation. No systematic attempt has been made to approximate the magnitude of nonsampling errors associated with these estimates of scientists and engineers.

SECTION B. DETAILED STATISTICAL TABLES

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6. Selected employment characteristics of scientists and engineers by field: 1988...............................27

Table 1. Employment of scientists and engineers by field:
1976, 1978, 1980, 1982, 1984, 1986, and 1988

Field	1976	1978	1980	1982	1984	1986	1988
Total, all fields	2,331,200	2,609,000	2,860,400	3,253,100	3,995,500	4,626,500	5,286,400
Total scientists	959,500	1,071,000	1,184,500	1,405,700	1,781,400	2,186,300	2,567,800
Physical scientists	188,900	208,300	215,200	227,400	254,100	288,400	312,000
Chemists	132,800	143,000	148,800	154,100	168,600	184,700	197,000
Physicists/astronomers	44,300	36,400	47,200	47,800	61,200	72,600	77,800
Other physical scientists	11,800	18,800	19,300	25,800	24,300	31,100	37,100
Mathematical scientists	48,600	53,700	64,300	79,400	100,400	131,000	168,600
Mathematicians	43,400	46,300	53,400	62,500	83,900	110,700	145,100
Statisticians	5,200	7,300	11,000	16,900	16,500	20,300	23,500
Computer specialists	119,000	177,000	207,800	290,000	436,000	562,800	708,300
Environmental scientists	54,800	68,900	77,600	87,200	98,100	111,300	113,400
Earth scientists	46,500	54,000	64,000	73,600	82,300	93,700	94,200
Oceanographers	4,400	7,300	5,100	3,400	3,200	4,200	4,600
Atmospheric scientists	3,800	7,600	8,500	10,300	12,600	13,500	14,600
Life scientists	213,500	244,100	287,500	337,100	363,100	411,800	458,600
Biological scientists	139,400	164,000	198,300	232,000	290,600	273,300	299,400
Agricultural scientists	40,700	49,600	59,300	73,000	42,700	103,300	124,000
Medical scientists	33,300	30,500	29,900	19,500	27,900	35,200	35,200
Psychologists	112,500	121,700	128,100	136,000	206,500	253,800	275,900
Social scientists	222,300	197,400	204,000	237,800	329,200	427,800	531,000
Economists	62,500	62,100	75,000	103,100	125,600	163,300	219,800
Sociologists/anthropologists	33,900	40,900	48,300	57,600	77,700	93,400	93,900
Other social scientists	125,900	94,400	80,700	77,200	125,900	170,800	217,300
Total engineers	1,371,700	1,538,000	1,675,900	1,847,350	2,214,100	2,440,100	2,718,600
Aeronautical/astronautical	56,800	62,000	69,500	80,800	97,200	110,500	119,400
Chemical	77,300	84,200	94,500	107,700	140,100	149,000	148,500
Civil	188,200	211,700	232,100	250,200	312,700	346,300	356,900
Electrical/electronics	283,000	341,900	383,100	437,700	500,700	574,800	640,900
Industrial	NA	NA	NA	113,100	131,700	137,700	172,300
Materials	NA	NA	NA	30,200	51,300	53,100	65,600
Mechanical	276,200	299,300	322,600	367,800	446,600	492,600	497,800
Mining	NA	NA	NA	14,200	16,500	17,300	21,300
Nuclear	NA	NA	NA	18,200	22,100	22,700	29,000
Petroleum	NA	NA	NA	27,700	33,300	30,800	37,400
Other engineers	490,000	540,100	574,100	392,500	463,000	505,600	630,400

NA: Not Available

NOTE: Detail may not add to total because of rounding.
SOURCE: National Science Foundation, SRS.

Table 2. Scientists and engineers by field and employment status: 1988

Field	Employment Status			
	Total population	Total employed	Unemployed, seeking	Outside the labor force
Total, all fields	5,659,700	5,286,400	78,300	295,100
Total scientists	2,737,500	2,567,800	44,300	125,500
Physical scientists	337,800	312,000	4,500	21,400
Chemists	214,900	197,000	2,700	15,200
Physicists/astronomers	83,000	77,800	1,000	4,200
Other physical scientists	40,000	37,100	800	2,100
Mathematical scientists	178,900	168,600	1,600	8,800
Mathematicians	154,400	145,100	1,400	7,900
Statisticians	24,600	23,500	200	900
Computer specialists	727,100	708,300	6,800	11,900
Environmental scientists	125,400	113,400	5,000	7,100
Earth scientists	105,300	94,200	4,900	6,300
Oceanographers	5,000	4,600	(1)	400
Atmospheric scientists	15,100	14,600	100	500
Life scientists	502,300	458,600	9,000	34,700
Biological scientists	328,800	299,400	5,800	23,600
Agricultural scientists	135,900	124,000	3,000	8,900
Medical scientists	37,600	35,200	200	2,300
Psychologists	298,000	275,900	6,200	16,000
Social scientists	567,900	531,000	11,400	25,500
Economists	235,100	219,800	6,500	8,800
Sociologists/anthropologists	101,400	93,900	1,800	5,700
Other social scientists	231,400	217,300	3,000	11,100
Total engineers	2,922,200	2,718,600	34,000	169,600
Aeronautical/astronautical	126,100	119,400	600	6,100
Chemical	170,100	148,500	3,800	17,800
Civil	391,000	355,900	5,700	29,500
Electrical/electronics	690,100	640,900	7,200	42,000
Industrial	181,400	172,300	2,000	7,100
Materials	71,200	65,600	1,200	4,400
Mechanical	552,000	497,800	7,000	47,200
Mining	23,200	21,300	500	1,500
Nuclear	29,900	29,000	200	700
Petroleum	40,600	37,400	1,400	1,900
Other engineers	646,300	630,400	4,600	11,400

(1) Too few cases to estimate.

NOTE: Detail may not add to total because of rounding.
SOURCE: National Science Foundation, SRS.

Table 3. Employed scientists and engineers by field and sector of employment: 1988

Field	Total	Sector of employment						
		Business and industry			Educational institutions			Non-profit orgs.
		Total	Industry	Self-employed	Total	4-year colleges, univ.	Other	
Total, all fields	5,286,400	3,597,000	2,899,500	697,500	712,300	531,300	181,000	186,000
Total scientists	2,567,800	1,434,800	1,059,100	375,600	595,900	432,000	163,900	146,300
Physical scientists	312,000	175,100	151,600	23,500	79,200	66,600	12,700	10,200
Chemists	197,000	131,000	113,900	17,100	38,800	32,900	5,900	4,800
Physicists/astronomers	77,800	27,900	25,200	2,700	30,200	27,800	2,400	3,900
Other physical scientists	37,100	16,200	12,500	3,700	10,300	5,900	4,400	1,500
Mathematical scientists	168,600	70,800	59,400	11,500	74,400	49,400	25,000	3,400
Mathematicians	145,100	60,700	51,200	9,500	67,300	43,600	23,700	2,200
Statisticians	23,500	10,200	8,200	2,000	7,100	5,800	1,200	1,200
Computer specialists	708,300	557,600	433,900	123,700	46,600	36,100	10,500	17,200
Environmental scientists	113,400	66,200	47,100	19,100	18,100	16,100	2,000	1,400
Earth scientists	94,200	61,000	43,300	17,700	14,300	12,400	1,900	700
Oceanographers	4,600	700	600	200	1,900	1,900	100	400
Atmospheric scientists	14,600	4,500	3,300	1,100	1,900	1,800	100	300
Life scientists	458,600	173,700	124,100	49,600	161,600	105,300	56,300	33,400
Biological scientists	299,400	101,100	75,100	26,000	114,500	75,900	38,600	22,400
Agricultural scientists	124,000	65,000	42,300	22,800	28,900	27,200	1,700	5,200
Medical scientists	35,200	7,600	6,800	800	18,300	2,200	16,100	5,800
Psychologists	275,900	112,400	57,200	55,200	85,600	48,800	36,900	48,600
Social scientists	531,000	279,000	185,800	93,200	130,300	109,700	20,600	32,100
Economists	219,800	140,700	94,100	46,600	41,800	35,800	5,900	5,100
Sociologists/anthropologists	93,900	36,000	20,000	16,000	33,200	29,600	3,600	8,100
Other social scientists	217,300	102,300	71,700	30,600	55,400	44,300	11,000	18,900
Total engineers	2,718,600	2,162,200	1,840,400	321,900	116,400	99,300	17,100	39,700
Aeronautical/astronautical	119,400	87,300	74,300	13,000	4,100	3,900	300	2,800
Chemical	148,500	127,600	108,900	18,700	7,300	6,600	700	2,500
Civil	365,900	222,800	172,200	50,600	10,600	8,800	1,800	1,900
Electrical/electronics	640,900	517,300	440,400	76,900	31,300	25,300	6,000	9,400
Industrial	172,300	151,300	131,600	19,700	6,200	5,100	1,100	2,900
Materials	65,600	55,400	48,600	6,800	5,300	5,200	200	400
Mechanical	497,800	430,400	374,000	56,400	19,100	15,600	3,500	5,700
Mining	21,300	17,600	14,700	2,900	1,200	1,200	(1)	(1)
Nuclear	29,000	17,600	16,000	1,500	1,600	900	700	400
Petroleum	37,400	34,000	27,800	6,100	700	600	(1)	100
Other engineers	630,400	501,000	431,800	69,200	29,100	26,300	2,800	13,800

See footnotes at end of table.

Table 3. Employed scientists and engineers by field and sector of employment: 198[illegible]-Continued

Field	Sector of employment				
	Federal gov't	Military	State/ local/ other gov't	Other	No report
Total, all fields	395,700	40,400	270,700	32,600	51,600
Total scientists	192,200	13,800	146,100	18,800	19,800
Physical scientists	31,800	1,100	9,100	2,800	2,700
Chemists	13,500	500	6,900	600	1,100
Physicists/astronomers	12,200	300	400	1,700	1,200
Other physical scientists	6,100	300	1,800	600	400
Mathematical scientists	13,900	1,300	3,200	500	1,100
Mathematicians	10,400	1,200	1,900	400	1,100
Statisticians	3,500	100	1,300	100	(1)
Computer specialists	45,100	5,000	25,300	3,600	6,900
Environmental scientists	17,700	1,600	6,300	800	1,100
Earth scientists	10,600	300	5,800	500	900
Oceanographers	1,200	100	300	(1)	100
Atmospheric scientists	6,000	1,200	200	300	100
Life scientists	46,400	2,000	34,300	3,500	3,700
Biological scientists	34,300	1,000	21,700	2,200	2,200
Agricultural scientists	10,900	400	11,500	1,100	1,100
Medical scientists	1,100	600	1,200	200	500
Psychologists	7,100	600	16,800	2,400	2,300
Social scientists	29,300	2,200	51,100	5,200	1,900
Economists	17,100	500	11,500	2,500	800
Sociologists/anthropologists	2,300	300	12,900	1,100	(1)
Other social scientists	9,900	1,400	26,700	1,600	1,100
Total engineers	203,400	26,600	124,600	13,800	31,800
Aeronautical/astronautical	17,300	5,000	400	400	2,000
Chemical	6,800	400	1,900	500	1,400
Civil	32,900	4,500	77,900	1,600	3,800
Electrical/electronics	56,900	5,600	7,100	3,400	8,000
Industrial	7,900	600	2,500	300	800
Materials	2,800	100	400	200	1,000
Mechanical	30,000	1,900	4,600	1,900	4,200
Mining	1,500	(1)	400	200	200
Nuclear	6,300	2,800	100	200	200
Petroleum	1,000	(1)	800	300	600
Other engineers	37,900	5,600	28,400	5,000	9,500

(1) Too few cases to estimate.

NOTE: Detail may not add to total because of rounding.
SOURCE: National Science Foundation, SRS.

Table 4. Employed scientists and engineers by field and primary work activity: 1988

Field	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Development	Total	Management of R&D	Other than R&D
Total, all fields	5,286,400	1,436,500	158,700	294,000	983,900	1,423,700	435,400	988,300
Total scientists	2,567,800	552,100	141,400	190,000	220,700	626,800	181,200	445,700
Physical scientists	312,000	126,700	32,100	46,300	48,300	74,800	42,900	31,900
Chemists	197,000	80,600	13,100	28,800	38,700	46,300	24,400	21,900
Physicists/astronomers	77,800	34,200	16,200	11,800	6,200	20,600	14,000	6,600
Other physical scientists	37,100	11,900	2,800	5,700	3,400	7,900	4,400	3,500
Mathematical scientists	168,600	22,600	6,800	8,300	7,500	45,300	17,800	27,500
Mathematicians	145,100	18,900	6,500	6,000	6,500	41,500	15,700	25,700
Statisticians	23,500	3,600	400	2,300	1,000	3,800	2,100	1,800
Computer specialists	708,300	147,300	5,800	14,400	127,100	105,200	40,700	64,500
Environmental scientists	113,400	35,800	10,000	19,600	6,200	21,800	7,500	14,300
Earth scientists	94,200	27,500	6,900	15,100	5,500	17,600	5,300	12,300
Oceanographers	4,600	2,800	1,500	1,100	100	1,100	700	400
Atmospheric scientists	14,600	5,500	1,600	3,400	500	3,100	1,500	1,600
Life scientists	458,600	146,100	64,700	62,700	18,700	118,900	32,600	86,400
Biological scientists	299,400	102,800	52,600	38,300	11,800	71,800	19,800	52,000
Agricultural scientists	124,000	29,500	5,500	18,300	5,700	37,400	9,500	28,000
Medical scientists	35,200	13,800	6,600	6,000	1,200	9,700	3,300	6,400
Psychologists	275,900	22,700	9,300	10,600	2,800	72,000	10,800	61,300
Social scientists	531,000	51,000	12,800	28,300	10,000	188,700	28,900	159,800
Economists	219,800	27,200	5,300	17,100	4,800	70,800	10,300	60,500
Sociologists/anthropologists	93,900	8,400	4,200	3,600	600	29,600	6,300	23,300
Other social scientists	217,300	15,400	3,200	7,600	4,600	88,400	12,400	76,000
Total engineers	2,718,600	884,400	17,200	104,000	763,200	796,900	254,300	542,600
Aeronautical/astronautical	119,400	54,300	1,900	9,000	43,500	31,000	20,500	10,500
Chemical	148,500	50,500	1,500	7,200	41,800	49,700	18,000	31,700
Civil	355,900	53,700	1,000	6,400	46,300	129,200	11,400	117,800
Electrical/electronics	640,900	274,100	5,000	28,800	240,300	177,100	84,400	92,700
Industrial	172,300	32,200	300	1,300	30,600	58,200	10,100	48,100
Materials	65,600	26,300	1,700	5,900	18,700	18,300	7,000	11,400
Mechanical	497,800	210,600	3,000	15,600	192,000	148,900	51,300	97,600
Mining	21,300	3,200	100	1,500	1,600	5,300	2,100	3,200
Nuclear	29,000	6,900	200	2,700	4,100	6,300	2,400	3,900
Petroleum	37,400	5,200	100	1,700	3,400	7,700	1,400	6,300
Other engineers	630,400	167,400	2,500	24,000	140,900	165,100	45,600	119,500

See footnotes at end of table.

Table 4. Employed scientists and engineers by field and primary work activity: 1988-Continued

Field	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Total, all fields	410,700	288,500	669,400	580,400	241,000	90,900	85,600	59,600
Total scientists	346,200	100,900	183,000	448,500	140,000	90,000	55,400	24,800
Physical scientists	50,400	5,700	36,700	7,500	5,200	300	2,900	1,700
Chemists	25,800	3,000	31,700	3,100	3,900	200	1,400	1,000
Physicists/astronomers	16,000	1,000	1,800	2,500	300	(1)	800	500
Other physical scientists	8,600	1,800	3,300	1,900	900	100	700	200
Mathematical scientists	60,400	3,500	6,500	21,200	5,500	(1)	2,300	1,200
Mathematicians	57,200	2,500	5,800	11,000	5,300	(1)	1,600	1,100
Statisticians	3,200	900	700	10,200	200	(1)	700	100
Computer specialists	24,000	41,700	29,700	337,500	10,100	(1)	6,200	6,700
Environmental scientists	9,100	7,500	24,500	7,300	2,800	(1)	2,800	1,800
Earth scientists	8,600	6,900	23,000	4,700	2,700	(1)	1,900	1,100
Oceanographers	100	(1)	100	200	(1)	(1)	300	(1)
Atmospheric scientists	300	500	1,400	2,400	200	(1)	500	700
Life scientists	67,500	12,200	49,900	15,400	24,800	8,700	10,600	4,600
Biological scientists	53,400	7,200	25,300	10,600	14,500	6,100	5,400	2,400
Agricultural scientists	7,100	4,200	23,400	4,500	10,300	900	5,100	1,500
Medical scientists	7,000	800	1,100	300	(1)	1,700	100	700
Psychologists	42,500	8,000	10,600	6,800	24,000	78,600	7,100	3,600
Social scientists	92,400	22,200	25,200	52,800	67,600	2,400	23,500	5,200
Economists	30,200	12,600	10,800	28,200	29,100	(1)	8,400	2,600
Sociologists/anthropologists	22,100	1,700	7,000	7,600	10,900	100	6,200	300
Other social scientists	40,100	8,000	7,400	17,000	27,600	2,300	8,900	2,300
Total engineers	64,500	187,700	486,400	131,900	101,000	900	30,100	34,800
Aeronautical/astronautical	3,200	3,100	12,700	6,800	1,700	200	4,300	2,200
Chemical	3,300	7,200	23,900	5,100	4,900	(1)	1,300	2,600
Civil	6,500	59,600	77,000	15,300	5,000	300	4,400	5,000
Electrical/electronics	15,900	25,500	97,200	26,200	12,200	100	5,500	7,000
Industrial	4,500	8,800	46,700	13,000	5,800	(1)	1,700	1,500
Materials	2,100	1,900	13,100	1,100	2,100	(1)	500	700
Mechanical	9,500	22,200	73,700	13,700	10,800	100	3,300	5,100
Mining	800	2,400	7,200	1,500	600	(1)	100	200
Nuclear	1,200	2,400	7,800	2,500	800	(1)	1,000	100
Petroleum	300	3,300	16,100	2,000	1,900	(1)	300	600
Other engineers	17,200	51,300	111,000	44,800	55,700	200	7,600	9,900

(1) Too few cases to estimate.

NOTE: Detail may not add to total because of rounding.
SOURCE: National Science Foundation, SRS.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Develop-ment	Total	Management of R&D	Other than R&D
Total, all fields	5,286,400	1,436,500	158,700	294,000	983,900	1,423,700	435,400	988,300
Business/industry	3,597,000	1,011,000	16,400	135,200	859,400	1,040,000	320,600	719,400
Industry	2,899,500	858,700	11,400	109,500	737,800	893,900	293,500	600,400
Self-employed	697,500	152,300	5,000	25,700	121,600	146,200	27,100	119,100
Educational institutions	712,300	195,600	106,500	72,300	16,800	77,600	20,400	57,100
4-year colleges/univ.	531,300	161,700	85,300	61,700	14,800	60,200	16,900	43,300
Other	181,000	33,900	21,200	10,700	2,000	17,400	3,500	13,900
Non-profit organizations	186,000	41,800	10,600	17,000	14,200	57,800	17,700	40,200
Federal gov't	395,700	127,100	19,100	47,700	60,300	126,800	51,500	75,300
Military	40,400	5,800	700	2,200	2,900	15,300	4,600	10,700
State/local/other gov't	270,700	41,000	3,000	14,800	23,200	94,900	16,000	78,900
Other	32,600	8,500	1,400	2,800	4,400	9,200	3,100	6,100
No report	51,600	5,600	1,000	2,100	2,600	2,100	1,300	800
Total scientists	2,567,800	552,100	141,400	190,000	220,700	626,800	181,200	445,700
Business/industry	1,434,800	274,600	11,500	78,300	184,800	410,600	118,100	292,500
Industry	1,059,100	217,200	7,900	62,700	146,600	329,500	106,800	222,600
Self-employed	375,600	57,400	3,600	15,700	38,100	81,100	11,300	69,900
Educational institutions	595,900	158,100	98,200	52,900	6,900	63,000	16,100	46,900
4-year colleges/univ.	432,000	126,000	77,300	42,800	5,900	47,000	12,800	34,200
Other	163,900	32,100	20,900	10,200	1,000	15,900	3,300	12,700
Non-profit organizations	146,300	29,100	10,300	12,600	6,200	44,100	11,500	32,600
Federal gov't	192,200	62,000	16,300	30,900	14,800	52,400	19,500	32,900
Military	13,800	1,900	300	1,100	500	5,400	1,700	3,700
State/local/other gov't	146,100	19,900	2,700	11,500	5,800	45,300	11,300	34,100
Other	18,800	4,000	1,200	1,600	1,100	4,900	2,100	2,800
No report	19,800	2,500	900	900	600	1,100	800	300
Physical scientists	312,000	126,700	32,100	46,300	48,300	74,800	42,900	31,900
Business/industry	175,100	77,100	4,500	28,300	44,300	54,300	30,500	23,700
Industry	151,600	69,900	3,900	25,300	40,700	49,800	29,800	20,000
Self-employed	23,500	7,200	600	3,000	3,700	4,500	800	3,700
Educational institutions	79,200	24,200	18,500	5,000	700	5,600	1,700	3,900
4-year colleges/univ.	66,600	23,100	18,200	4,400	600	5,400	1,700	3,700
Other	12,700	1,100	300	700	100	200	100	200
Non-profit organizations	10,200	4,800	1,400	2,700	600	3,300	2,400	900
Federal gov't	31,800	16,600	6,000	8,200	2,400	9,000	6,600	2,400
Military	1,100	100	100	100	(1)	200	100	100
State/local/other gov't	9,100	1,900	700	1,000	200	900	200	700
Other	2,800	1,300	600	700	(1)	1,100	800	200
No report	2,700	700	400	200	100	400	400	(1)
Chemists	197,000	80,600	13,100	28,800	38,700	46,300	24,400	21,900
Business/industry	131,000	59,700	2,700	20,400	36,500	37,100	19,700	17,400
Industry	113,900	53,500	2,400	17,900	33,200	34,500	19,400	15,100
Self-employed	17,100	6,200	300	2,600	3,300	2,600	300	2,300
Educational institutions	38,800	11,100	7,900	3,000	300	2,800	700	2,100
4-year colleges/univ.	32,900	10,200	7,500	2,400	200	2,800	700	2,100
Other	5,900	900	300	500	100	(1)	(1)	(1)
Non-profit organizations	4,800	2,000	300	1,400	300	1,800	1,000	800
Federal gov't	13,500	6,100	1,800	2,800	1,500	3,900	2,800	1,100
Military	500	100	(1)	100	(1)	(1)	(1)	(1)
State/local/other gov't	6,900	1,200	300	800	100	800	200	600
Other	600	200	(1)	100	(1)	200	(1)	200
No report	1,100	300	100	100	100	(1)	(1)	(1)
Physicists/astronomers	77,800	34,200	16,200	11,800	6,200	20,600	14,000	6,600
Business/industry	27,900	11,500	1,600	4,800	5,100	12,200	8,500	3,700
Industry	25,200	10,800	1,400	4,500	4,900	11,700	8,500	3,200
Self-employed	2,700	700	200	300	200	400	(1)	400
Educational institutions	30,200	11,400	9,500	1,700	200	2,300	600	1,800
4-year colleges/univ.	27,800	11,200	9,500	1,600	200	2,100	600	1,600
Other	2,400	200	(1)	100	(1)	200	(1)	200
Non-profit organizations	3,900	1,900	1,000	800	100	1,400	1,300	100
Federal gov't	12,200	7,900	3,100	4,000	800	3,600	2,600	1,000
Military	300	100	100	(1)	(1)	100	100	(1)
State/local/other gov't	400	400	300	(1)	(1)	(1)	(1)	(1)
Other	1,700	900	500	400	(1)	600	600	(1)
No report	1,200	200	200	(1)	(1)	400	400	(1)

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Develop- ment	Total	Management of R&D	Other than R&D
Other physical scientists	37,100	11,900	2,800	5,700	3,400	7,900	4,400	3,500
Business/industry	16,200	5,900	200	3,000	2,700	5,000	2,300	2,600
Industry	12,500	5,600	100	2,900	2,600	3,600	1,900	1,600
Self-employed	3,700	300	100	200	100	1,400	400	1,000
Educational institutions	10,300	1,700	1,200	400	100	500	400	(1)
4-year colleges/univ.	5,900	1,700	1,200	400	100	400	400	(1)
Other	4,400	(1)	(1)	(1)	(1)	100	100	(1)
Non-profit organizations	1,800	800	100	500	300	500	200	300
Federal gov't	6,100	2,700	1,100	1,500	200	1,500	1,200	300
Military	300	(1)	(1)	(1)	(1)	100	(1)	100
State/local/other gov't	1,800	400	100	200	(1)	100	(1)	100
Other	800	200	(1)	100	(1)	300	200	100
No report	400	200	100	(1)	(1)	(1)	(1)	(1)
Mathematical scientists	168,800	22,600	6,800	8,300	7,500	45,300	17,800	27,500
Business/industry	70,800	8,600	100	3,100	5,500	35,700	14,400	21,300
Industry	59,400	7,300	100	2,300	4,900	31,100	13,800	17,300
Self-employed	11,500	1,300	(1)	800	500	4,600	600	4,000
Educational institutions	74,400	8,400	6,300	1,900	200	3,800	700	3,100
4-year colleges/univ.	49,400	7,800	6,300	1,300	200	2,400	700	1,700
Other	25,000	600	100	600	(1)	1,400	(1)	1,400
Non-profit organizations	3,400	800	100	600	200	1,100	200	900
Federal gov't	13,900	4,200	300	2,400	1,500	3,400	1,900	1,500
Military	1,300	100	(1)	100	(1)	600	300	300
State/local/other gov't	3,200	300	(1)	200	100	600	400	300
Other	500	100	100	(1)	(1)	200	100	100
No report	1,100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mathematicians	145,100	18,900	6,500	6,000	6,500	41,500	15,700	25,700
Business/industry	60,700	7,600	100	2,800	4,800	32,800	12,900	19,900
Industry	51,200	6,500	100	2,100	4,300	28,500	12,400	16,100
Self-employed	9,500	1,200	(1)	700	500	4,300	600	3,800
Educational institutions	67,300	6,900	6,100	600	200	3,500	600	2,900
4-year colleges/univ.	43,600	6,800	6,000	600	200	2,100	600	1,500
Other	23,700	100	100	100	(1)	1,400	(1)	1,400
Non-profit organizations	2,200	600	100	500	100	1,000	100	900
Federal gov't	10,400	3,600	200	1,900	1,400	2,900	1,500	1,400
Military	1,200	100	(1)	100	(1)	600	300	300
State/local/other gov't	1,900	100	(1)	100	(1)	500	300	200
Other	400	100	100	(1)	(1)	200	100	100
No report	1,100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Statisticians	23,800	3,600	400	2,300	1,000	3,800	2,100	1,800
Business/industry	10,200	1,000	(1)	300	700	2,800	1,400	1,400
Industry	8,200	800	(1)	200	600	2,600	1,400	1,200
Self-employed	2,000	200	(1)	100	(1)	200	(1)	200
Educational institutions	7,100	1,500	300	1,300	(1)	300	(1)	200
4-year colleges/univ.	5,800	1,000	300	700	(1)	200	(1)	200
Other	1,200	500	(1)	500	(1)	100	(1)	100
Non-profit organizations	1,200	200	(1)	100	100	100	100	(1)
Federal gov't	3,500	600	100	500	100	500	400	100
Military	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	1,300	200	(1)	200	100	200	100	100
Other	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Computer specialists	708,300	147,300	5,800	14,400	127,100	105,200	40,700	64,500
Business/industry	557,600	124,000	900	10,900	112,200	86,300	34,100	52,200
Industry	433,900	92,500	500	8,300	83,700	73,600	28,200	45,400
Self-employed	123,700	31,400	400	2,600	28,600	12,700	6,000	6,800
Educational institutions	46,600	8,500	4,100	1,600	2,900	4,300	1,800	2,500
4-year colleges/univ.	36,100	8,200	4,000	1,500	2,700	3,200	1,100	2,100
Other	10,500	300	100	100	100	1,100	700	400
Non-profit organizations	17,200	3,500	400	500	2,600	1,700	1,100	600
Federal gov't	46,100	7,200	200	900	6,100	7,600	1,900	5,700
Military	5,000	400	(1)	(1)	300	2,200	900	1,400
State/local/other gov't	25,300	1,900	(1)	200	1,700	2,800	800	2,100
Other	3,800	1,100	(1)	(1)	1,000	200	200	(1)
No report	6,900	700	200	100	400	100	(1)	100

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Develop-ment	Total	Management of R&D	Other than R&D
Environmental scientists	113,400	35,800	10,000	19,600	6,200	21,800	7,500	14,300
Business/industry	66,200	15,700	1,400	9,400	4,800	14,000	4,700	9,300
Industry	47,100	10,900	300	6,800	3,700	11,000	4,100	6,900
Self-employed	19,100	4,800	1,100	2,600	1,100	3,000	700	2,400
Educational institutions	18,100	8,100	5,100	2,900	100	1,000	300	700
4-year colleges/univ.	16,100	8,100	5,100	2,900	100	1,000	300	700
Other	2,000	100	100	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	1,400	800	400	400	(1)	400	200	200
Federal gov't	17,700	8,100	2,300	4,800	1,000	4,200	1,700	2,600
Military	1,600	600	100	500	100	200	100	200
State/local/other gov't	6,300	2,200	500	1,400	200	1,500	500	1,000
Other	800	100	(1)	100	(1)	300	(1)	300
No report	1,100	100	100	100	(1)	100	(1)	100
Earth scientists	94,200	27,500	6,900	15,100	5,500	17,600	5,300	12,300
Business/industry	61,000	14,700	1,200	8,900	4,600	12,300	3,500	8,800
Industry	43,300	10,300	300	6,500	3,500	9,400	2,800	6,600
Self-employed	17,700	4,400	900	2,400	1,000	2,900	700	2,200
Educational institutions	14,300	4,900	3,200	1,700	100	800	100	700
4-year colleges/univ.	12,400	4,900	3,200	1,600	100	800	100	700
Other	1,900	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	700	200	100	100	(1)	300	200	200
Federal gov't	10,600	5,400	1,800	3,000	700	2,400	1,100	1,300
Military	300	100	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	5,800	2,000	500	1,300	200	1,500	400	1,000
Other	500	100	(1)	100	(1)	200	(1)	200
No report	900	100	100	(1)	(1)	100	(1)	100
Oceanographers	4,600	2,800	1,500	1,100	100	1,100	700	400
Business/industry	700	200	(1)	200	(1)	300	100	300
Industry	600	200	(1)	200	(1)	200	100	100
Self-employed	200	(1)	(1)	(1)	(1)	100	(1)	100
Educational institutions	1,900	1,600	1,200	400	(1)	200	200	(1)
4-year colleges/univ.	1,900	1,600	1,200	400	(1)	200	200	(1)
Other	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	400	300	300	100	(1)	100	100	(1)
Federal gov't	1,200	500	100	300	100	500	400	100
Military	100	(1)	(1)	(1)	(1)	100	(1)	(1)
State/local/other gov't	300	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	100	100	(1)	100	(1)	(1)	(1)	(1)
Atmospheric scientists	14,600	5,500	1,600	3,400	500	3,100	1,500	1,600
Business/industry	4,500	800	200	300	300	1,500	1,200	300
Industry	3,300	400	(1)	200	200	1,500	1,200	300
Self-employed	1,100	400	200	100	100	(1)	(1)	(1)
Educational institutions	1,900	1,600	800	800	(1)	(1)	(1)	(1)
4-year colleges/univ.	1,800	1,500	700	800	(1)	(1)	(1)	(1)
Other	100	100	100	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	300	300	(1)	200	(1)	(1)	(1)	(1)
Federal gov't	6,000	2,200	400	1,500	200	1,300	200	1,100
Military	1,200	600	100	400	100	100	(1)	100
State/local/other gov't	200	100	(1)	100	(1)	100	100	(1)
Other	300	(1)	(1)	(1)	(1)	100	(1)	100
No report	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Life scientists	458,600	146,100	64,700	62,700	18,700	118,900	32,600	86,400
Business/industry	173,700	31,400	3,000	15,700	12,700	63,800	15,400	48,400
Industry	124,100	24,600	2,100	12,000	10,400	50,300	14,500	35,800
Self-employed	49,600	6,800	900	3,700	2,300	13,400	900	12,500
Educational institutions	161,600	75,500	46,200	27,600	1,700	14,900	6,900	8,000
4-year colleges/univ.	105,300	48,300	26,700	20,400	1,300	10,800	5,800	5,000
Other	56,300	27,200	19,600	7,200	400	4,100	1,100	3,000
Non-profit organizations	33,400	12,700	7,100	4,700	1,000	9,200	2,000	7,200
Federal gov't	46,400	17,500	6,400	8,900	2,200	15,500	4,000	11,500
Military	2,000	600	100	400	100	900	400	500
State/local/other gov't	34,300	6,600	900	4,600	1,000	14,100	3,800	10,300
Other	3,500	800	600	300	(1)	400	100	400
No report	3,700	900	400	500	(1)	200	100	100

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Development	Total	Management of R&D	Other than R&D
Biological scientists	299,400	102,800	52,600	38,300	11,800	71,800	19,800	52,000
Business/industry	101,100	21,800	2,700	11,000	8,200	37,500	9,800	27,700
Industry	75,100	17,500	2,000	8,300	7,100	30,400	9,600	20,900
Self-employed	26,000	4,300	600	2,600	1,000	7,000	200	6,800
Educational institutions	114,500	51,100	36,900	13,500	800	8,800	4,100	4,700
4-year colleges/univ.	75,900	32,400	22,200	9,500	700	6,200	3,300	2,900
Other	38,600	18,700	14,700	4,000	100	2,600	800	1,800
Non-profit organizations	22,400	10,400	6,200	3,700	600	4,300	800	3,500
Federal gov't	34,300	13,100	5,200	6,400	1,500	12,400	3,100	9,200
Military	1,000	400	(1)	400	100	500	(1)	500
State/local/other gov't	21,700	4,600	800	3,100	700	8,100	1,900	6,300
Other	2,200	600	500	100	(1)	200	(1)	200
No report	2,200	700	300	400	(1)	100	100	100
Agricultural scientists	124,000	29,500	5,500	18,300	5,700	37,400	9,500	28,000
Business/industry	65,000	7,600	400	3,300	3,900	22,200	4,200	18,000
Industry	42,300	5,300	100	2,300	2,900	16,000	3,700	12,300
Self-employed	22,800	2,400	300	1,000	1,100	6,300	500	5,700
Educational institutions	28,900	15,200	3,800	10,800	600	4,800	2,500	2,200
4-year colleges/univ.	27,200	15,000	3,700	10,700	600	4,600	2,400	2,100
Other	1,700	200	100	(1)	(1)	200	100	200
Non-profit organizations	5,200	400	(1)	200	200	2,200	100	2,100
Federal gov't	10,900	4,100	1,100	2,300	700	2,800	700	2,100
Military	400	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	11,500	1,800	100	1,400	300	5,200	1,900	3,300
Other	1,100	200	100	100	(1)	200	100	100
No report	1,100	200	(1)	100	(1)	(1)	(1)	(1)
Medical scientists	35,200	13,800	6,600	6,000	1,200	9,700	3,300	6,400
Business/industry	7,600	1,900	(1)	1,400	600	4,100	1,400	2,700
Industry	6,800	1,800	(1)	1,400	400	3,900	1,200	2,700
Self-employed	800	100	(1)	(1)	100	200	200	(1)
Educational institutions	18,300	9,200	5,500	3,300	400	1,300	200	1,100
4-year colleges/univ.	2,200	900	700	100	(1)	100	(1)	100
Other	16,100	8,300	4,800	3,200	400	1,300	200	1,100
Non-profit organizations	5,800	1,900	900	800	200	2,800	1,100	1,700
Federal gov't	1,100	400	100	300	(1)	300	100	100
Military	600	100	100	(1)	(1)	400	400	100
State/local/other gov't	1,200	100	(1)	100	(1)	800	100	700
Other	200	100	(1)	100	(1)	(1)	(1)	(1)
No report	500	100	(1)	100	(1)	(1)	(1)	(1)
Psychologists	275,900	22,700	9,300	10,600	2,800	72,000	10,800	61,300
Business/industry	112,400	2,900	400	1,300	1,200	36,800	4,000	32,900
Industry	57,200	1,800	400	800	600	27,600	2,900	24,800
Self-employed	55,200	1,200	(1)	600	600	9,200	1,100	8,100
Educational institutions	85,600	12,800	7,700	4,700	400	15,500	1,500	14,000
4-year colleges/univ.	48,800	10,600	7,100	3,300	200	9,900	1,300	8,600
Other	36,900	2,200	600	1,400	200	5,600	100	5,400
Non-profit organizations	48,600	2,800	500	1,700	700	11,900	3,100	8,800
Federal gov't	7,100	2,600	500	1,900	200	1,900	600	1,300
Military	600	(1)	(1)	(1)	(1)	500	100	400
State/local/other gov't	16,800	1,200	200	600	400	4,300	900	3,300
Other	2,400	400	(1)	400	(1)	1,300	700	600
No report	2,300	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Social scientists	531,000	51,000	12,800	28,300	10,000	188,700	28,900	159,800
Business/industry	279,000	14,900	1,100	9,700	4,100	119,700	14,900	104,800
Industry	185,800	10,300	600	7,100	2,600	86,000	13,600	72,300
Self-employed	93,200	4,600	600	2,600	1,500	33,700	1,300	32,500
Educational institutions	130,300	20,600	10,200	9,300	1,100	17,900	3,300	14,600
4-year colleges/univ.	109,700	19,900	10,000	9,000	900	14,400	2,000	12,400
Other	20,600	600	200	300	200	3,500	1,300	2,200
Non-profit organizations	32,100	3,600	500	2,000	1,100	16,800	2,800	14,000
Federal gov't	29,300	5,800	600	3,700	1,400	10,600	2,800	7,900
Military	2,200	(1)	(1)	(1)	(1)	900	(1)	900
State/local/other gov't	51,100	5,900	300	3,400	2,200	21,000	4,600	16,400
Other	5,200	300	(1)	200	100	1,600	300	1,200
No report	1,900	(1)	(1)	(1)	(1)	300	300	(1)

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Develop-ment	Total	Management of R&D	Other than R&D
Economists	219,800	27,200	5,300	17,100	4,800	70,800	10,300	60,500
Business/industry	140,700	8,300	800	5,800	1,800	58,200	6,400	51,800
Industry	94,100	6,300	500	4,300	1,500	41,300	6,100	35,200
Self-employed	46,600	2,000	300	1,500	300	16,900	300	16,600
Educational institutions	41,800	9,700	3,800	5,800	200	2,400	1,200	1,300
4-year colleges/univ.	35,800	9,700	3,800	5,800	200	2,300	1,100	1,200
Other	5,900	(1)	(1)	(1)	(1)	100	100	100
Non-profit organizations	5,100	2,000	400	800	800	1,600	300	1,200
Federal gov't	17,100	4,500	400	3,100	1,100	4,700	1,500	3,200
Military	500	(1)	(1)	(1)	(1)	300	(1)	300
State/local/other gov't	11,500	2,400	(1)	1,300	1,000	3,200	600	2,600
Other	2,500	200	(1)	100	(1)	400	200	200
No report	800	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sociologists/anthropologists	93,900	8,400	4,200	3,600	600	29,600	6,300	23,300
Business/industry	36,600	800	400	400	(1)	14,600	2,800	11,800
Industry	20,000	300	100	200	(1)	8,900	2,400	6,500
Self-employed	16,000	500	300	200	(1)	5,700	400	5,300
Educational institutions	33,200	5,000	3,400	1,400	300	5,400	1,000	4,400
4-year colleges/univ.	29,600	4,500	3,200	1,200	100	4,400	500	3,900
Other	3,600	600	200	200	200	1,100	600	500
Non-profit organizations	8,100	1,000	100	600	200	4,000	1,200	2,900
Federal gov't	2,300	300	100	100	(1)	900	200	600
Military	300	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	12,900	1,200	200	900	(1)	4,200	1,000	3,200
Other	1,100	100	(1)	(1)	100	400	100	400
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other social scientists	217,300	15,400	3,200	7,600	4,600	88,400	12,400	76,000
Business/industry	102,300	5,800	(1)	3,500	2,300	46,900	5,700	41,200
Industry	71,700	3,700	(1)	2,600	1,100	35,800	5,100	30,700
Self-employed	30,600	2,100	(1)	800	1,200	11,100	600	10,500
Educational institutions	55,400	5,800	3,000	2,100	700	10,000	1,100	8,900
4-year colleges/univ.	44,300	5,700	3,000	2,000	700	7,700	400	7,300
Other	11,000	(1)	(1)	(1)	(1)	2,300	700	1,700
Non-profit organizations	18,900	600	(1)	400	200	10,900	1,000	9,900
Federal gov't	9,900	1,000	200	800	300	5,200	1,200	4,100
Military	1,400	(1)	(1)	(1)	(1)	600	(1)	600
State/local/other gov't	26,700	2,300	(1)	1,100	1,100	13,600	3,000	10,600
Other	1,600	(1)	(1)	(1)	(1)	800	(1)	700
No report	1,100	(1)	(1)	(1)	(1)	300	300	(1)
Total engineers	2,718,600	884,400	17,200	104,000	763,200	796,900	254,300	542,600
Business/industry	2,162,200	736,400	4,900	56,800	674,700	629,400	202,500	426,900
Industry	1,840,400	641,500	3,500	46,800	591,200	564,400	186,700	377,700
Self-employed	321,900	94,800	1,400	10,000	83,500	65,000	15,800	49,200
Educational institutions	116,400	37,500	8,200	19,400	9,900	14,600	4,300	10,300
4-year colleges/univ.	99,300	35,700	8,000	18,900	8,900	13,200	4,100	9,100
Other	17,100	1,800	200	500	1,000	1,400	200	1,200
Non-profit organizations	39,700	12,700	400	4,400	8,000	13,700	6,100	7,600
Federal gov't	203,400	65,100	2,800	16,800	45,500	74,400	31,900	42,400
Military	26,600	3,900	400	1,100	2,400	9,900	2,900	7,000
State/local/other gov't	124,600	21,100	300	3,300	17,500	49,600	4,700	44,900
Other	13,800	4,900	200	1,100	3,300	4,300	1,000	3,300
No report	31,800	3,100	(1)	1,200	2,000	1,000	800	200
Aeronautical/astronautical	119,400	54,300	1,900	9,000	43,500	31,000	20,500	10,500
Business/industry	87,300	42,700	400	4,500	37,900	23,900	15,200	8,800
Industry	74,300	36,000	300	3,500	32,200	23,100	14,800	8,300
Self-employed	13,000	6,700	100	900	5,700	800	400	400
Educational institutions	4,100	1,500	200	900	400	(1)	(1)	(1)
4-year colleges/univ.	3,900	1,400	200	800	300	(1)	(1)	(1)
Other	300	200	(1)	100	100	(1)	(1)	(1)
Non-profit organizations	2,800	1,600	(1)	1,000	500	400	400	(1)
Federal gov't	17,300	7,700	1,000	2,500	4,200	6,000	4,900	1,000
Military	5,000	400	200	(1)	200	600	400	200
State/local/other gov't	400	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	400	400	100	(1)	300	(1)	(1)	(1)
No report	2,000	(1)	(1)	(1)	(1)	(1)	(1)	(1)

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Development	Total	Management of R&D	Other than R&D
Chemical	148,500	50,500	1,500	7,200	41,800	49,700	18,000	31,700
Business/industry	127,600	43,900	600	4,200	39,000	42,800	14,100	28,700
Industry	108,900	38,700	500	3,200	34,900	39,100	13,000	26,100
Self-employed	18,700	5,200	100	1,000	4,100	3,700	1,100	2,600
Educational institutions	7,300	2,900	700	1,800	300	1,000	(1)	1,000
4-year colleges/univ.	6,600	2,900	700	1,800	300	1,000	(1)	1,000
Other	700	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	2,500	400	100	(1)	300	1,600	1,500	100
Federal gov't	6,800	2,800	100	1,000	1,700	3,000	2,200	800
Military	400	(1)	(1)	(1)	(1)	200	100	100
State/local/other gov't	1,900	300	(1)	(1)	200	1,100	100	900
Other	500	200	(1)	100	100	(1)	(1)	(1)
No report	1,400	200	(1)	(1)	100	(1)	(1)	(1)
Civil	355,900	53,700	1,000	6,400	46,300	129,200	11,400	117,800
Business/industry	222,800	31,800	300	2,100	29,400	73,800	6,600	67,200
Industry	172,200	25,800	300	1,600	23,900	59,600	5,400	54,100
Self-employed	50,600	6,000	(1)	500	5,500	14,200	1,100	13,100
Educational institutions	10,600	2,300	200	1,700	400	2,500	200	2,200
4-year colleges/univ.	8,800	2,300	200	1,600	400	2,000	200	1,800
Other	1,800	100	(1)	100	(1)	400	(1)	400
Non-profit organizations	1,900	100	(1)	(1)	(1)	1,000	200	700
Federal gov't	32,900	5,300	200	800	4,300	15,400	1,000	14,500
Military	4,500	300	(1)	(1)	300	2,700	200	2,500
State/local/other gov't	77,900	13,400	300	1,700	11,500	33,300	3,100	30,200
Other	1,600	300	(1)	(1)	300	500	(1)	400
No report	3,800	100	(1)	(1)	100	100	100	100
Electrical/electronics	640,900	274,100	5,000	28,800	240,300	177,100	84,400	92,700
Business/industry	517,300	228,200	1,200	15,900	211,100	144,800	68,600	76,200
Industry	440,400	193,000	700	12,700	179,500	136,300	65,700	70,600
Self-employed	76,900	35,200	500	3,200	31,600	8,600	2,900	5,600
Educational institutions	31,300	11,400	2,700	5,100	3,600	4,100	1,600	2,600
4-year colleges/univ.	25,300	10,800	2,600	5,000	3,200	3,700	1,600	2,100
Other	6,000	600	100	100	400	400	(1)	400
Non-profit organizations	9,400	3,700	300	1,200	2,300	3,000	1,200	1,800
Federal gov't	58,900	23,700	700	4,900	18,100	19,400	11,100	8,200
Military	5,600	1,300	100	400	800	2,400	1,100	1,300
State/local/other gov't	7,100	2,900	(1)	800	2,100	2,000	100	1,900
Other	3,400	1,600	100	300	1,300	1,200	500	700
No report	8,000	1,400	(1)	300	1,100	200	100	100
Industrial	172,300	32,200	300	1,300	30,600	58,200	10,100	48,100
Business/industry	151,300	28,400	100	800	27,500	53,200	8,600	44,600
Industry	131,600	25,600	100	700	24,800	47,100	7,000	40,100
Self-employed	19,700	2,800	(1)	100	2,600	6,100	1,600	4,500
Educational institutions	6,200	900	100	400	300	600	300	300
4-year colleges/univ.	5,100	800	100	400	200	600	300	300
Other	1,100	100	(1)	(1)	100	(1)	(1)	(1)
Non-profit organizations	2,900	900	(1)	(1)	900	1,000	(1)	1,000
Federal gov't	7,900	1,500	(1)	100	1,400	2,300	600	1,600
Military	600	(1)	(1)	(1)	(1)	300	(1)	300
State/local/other gov't	2,500	300	(1)	(1)	300	800	600	300
Other	300	100	(1)	(1)	100	(1)	(1)	(1)
No report	800	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Materials	65,600	26,300	1,700	5,900	18,700	18,300	7,000	11,400
Business/industry	55,400	21,700	400	3,500	17,800	16,800	6,000	10,800
Industry	48,600	19,500	300	3,000	16,200	14,500	5,400	9,100
Self-employed	6,800	2,200	100	600	1,600	2,300	600	1,700
Educational institutions	5,300	2,900	1,200	1,300	400	500	500	(1)
4-year colleges/univ.	5,200	2,900	1,200	1,300	400	300	300	(1)
Other	200	(1)	(1)	(1)	(1)	100	100	(1)
Non-profit organizations	400	100	(1)	(1)	100	100	(1)	100
Federal gov't	2,800	1,000	100	500	400	700	400	300
Military	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	400	(1)	(1)	(1)	(1)	200	(1)	100
Other	200	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	1,000	600	(1)	500	100	(1)	(1)	(1)

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Total	Research and development				Management/admin.		
		Total	Basic research	Applied research	Develop-ment	Total	Management of R&D	Other than R&D
Mechanical	497,800	210,600	3,000	15,600	192,000	148,900	51,300	97,600
Business/industry	430,400	189,400	1,000	9,100	179,300	131,000	43,500	87,500
Industry	374,000	167,500	600	7,500	159,300	117,900	39,900	78,000
Self-employed	56,400	21,900	400	1,600	20,000	13,100	3,600	9,500
Educational institutions	19,100	6,200	1,700	2,600	1,900	2,200	200	1,900
4-year colleges/univ.	15,600	5,700	1,700	2,500	1,600	2,100	200	1,900
Other	3,500	500	(1)	100	400	100	(1)	100
Non-profit organizations	5,700	1,900	(1)	800	1,100	1,800	1,400	400
Federal gov't	36,900	10,500	200	2,500	7,800	10,500	5,100	5,400
Military	1,900	600	(1)	(1)	500	600	200	400
State/local/other gov't	4,600	600	(1)	100	400	2,100	400	1,700
Other	1,900	1,000	(1)	300	700	300	100	200
No report	4,200	500	(1)	200	200	500	500	100
Mining	21,300	3,200	100	1,500	1,600	5,300	2,100	3,200
Business/industry	17,600	2,300	(1)	800	1,500	4,800	1,700	3,100
Industry	14,700	2,000	(1)	700	1,400	4,500	1,700	2,900
Self-employed	2,900	200	(1)	100	100	300	(1)	300
Educational institutions	1,200	200	(1)	200	(1)	(1)	(1)	(1)
4-year colleges/univ.	1,200	200	(1)	200	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	1,500	500	100	400	(1)	400	300	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	400	100	(1)	100	100	100	(1)	100
Other	200	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	200	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Nuclear	29,000	6,900	200	2,700	4,100	6,300	2,400	3,900
Business/industry	17,600	4,500	(1)	1,500	3,000	3,500	1,100	2,400
Industry	16,000	4,100	(1)	1,400	2,700	3,100	1,000	2,100
Self-employed	1,500	400	(1)	100	300	300	(1)	300
Educational institutions	1,600	600	100	300	100	(1)	(1)	(1)
4-year colleges/univ.	900	600	100	300	100	(1)	(1)	(1)
Other	700	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	400	300	(1)	100	200	(1)	(1)	(1)
Federal gov't	6,300	900	(1)	300	600	2,000	1,200	800
Military	2,800	400	(1)	300	100	800	100	700
State/local/other gov't	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	200	200	(1)	100	(1)	(1)	(1)	(1)
No report	200	(1)	(1)	(1)	(1)	100	(1)	(1)
Petroleum	37,400	5,200	100	1,700	3,400	7,700	1,400	6,300
Business/industry	34,000	4,400	(1)	1,300	3,000	7,400	1,400	6,000
Industry	27,800	3,700	(1)	1,200	2,500	6,300	1,300	5,000
Self-employed	6,100	700	(1)	200	500	1,100	100	1,000
Educational institutions	700	300	(1)	100	200	(1)	(1)	(1)
4-year colleges/univ.	600	300	(1)	100	200	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	1,000	300	(1)	(1)	300	200	(1)	100
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	800	100	(1)	100	(1)	100	(1)	100
Other	300	100	(1)	100	(1)	(1)	(1)	(1)
No report	800	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other engineers	630,400	167,400	2,800	24,000	140,900	166,100	46,600	119,800
Business/industry	501,000	139,200	900	13,100	125,300	127,300	35,800	91,800
Industry	431,800	125,600	700	11,200	113,800	112,900	31,400	81,400
Self-employed	69,200	13,600	200	1,900	11,800	14,500	4,400	10,100
Educational institutions	29,100	8,300	1,000	5,000	2,200	3,700	1,500	2,200
4-year colleges/univ.	26,300	8,000	900	4,900	2,200	3,300	1,400	2,000
Other	2,800	300	100	100	(1)	300	100	200
Non-profit organizations	13,800	3,800	100	1,100	2,700	4,800	1,400	3,400
Federal gov't	37,900	11,000	400	3,900	6,800	14,500	5,300	9,200
Military	5,800	800	(1)	300	500	2,300	800	1,500
State/local/other gov't	28,400	3,800	100	800	2,900	10,000	400	9,600
Other	5,000	800	(1)	100	900	2,300	300	2,000
No report	9,300	300	(1)	100	200	200	100	100

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Total, all fields	410,700	288,500	669,400	580,400	241,000	90,900	85,600	59,600
Business/industry	20,900	258,200	524,500	420,700	229,100	28,500	49,000	14,900
Industry	13,500	164,000	431,700	332,200	155,300	3,000	37,400	9,900
Self-employed	7,400	94,300	92,800	88,500	73,800	25,500	11,700	5,100
Educational institutions	363,200	6,300	14,300	25,500	1,500	21,900	3,200	3,200
4-year colleges/univ.	266,300	3,900	9,800	21,800	900	2,500	2,500	1,700
Other	97,000	2,400	4,400	3,600	600	19,400	800	1,500
Non-profit organizations	8,800	5,800	9,800	21,000	2,100	29,600	8,400	800
Federal gov't	4,000	7,800	55,300	61,300	3,000	1,900	6,500	1,800
Military	2,800	300	6,700	3,200	200	(1)	6,000	200
State/local/other gov't	7,600	7,700	52,900	42,500	4,200	8,200	10,400	1,200
Other	2,100	1,300	3,600	4,900	500	500	1,800	200
No report	1,300	1,000	2,400	1,300	400	200	200	37,200
Total scientists	346,200	100,900	183,000	448,500	140,000	80,000	55,400	24,800
Business/industry	12,100	84,000	137,000	318,400	132,200	28,200	30,500	7,200
Industry	6,600	47,500	102,900	245,700	79,900	2,700	22,700	4,400
Self-employed	5,500	36,500	34,100	72,600	52,300	25,500	7,800	2,700
Educational institutions	312,600	5,400	6,100	23,000	900	21,600	2,700	2,600
4-year colleges/univ.	226,000	3,200	3,700	19,500	600	2,500	2,000	1,500
Other	86,500	2,300	2,400	3,500	300	19,100	700	1,100
Non-profit organizations	8,200	2,700	3,500	18,700	2,000	29,400	7,900	700
Federal gov't	2,900	3,200	15,600	40,300	1,400	1,900	3,700	900
Military	1,100	(1)	1,500	1,800	200	(1)	1,800	100
State/local/other gov't	6,800	4,900	17,100	33,100	2,600	8,200	7,800	300
Other	1,900	200	1,700	4,200	500	500	1,000	(1)
No report	800	400	500	1,000	200	200	100	13,100
Physical scientists	50,400	5,700	36,700	7,800	5,200	300	2,900	1,700
Business/industry	600	5,700	26,900	4,500	4,700	(1)	1,200	(1)
Industry	600	1,800	22,100	3,400	3,100	(1)	1,000	(1)
Self-employed	(1)	3,900	4,800	1,100	1,600	(1)	200	(1)
Educational institutions	48,000	(1)	400	800	100	(1)	200	(1)
4-year colleges/univ.	36,900	(1)	400	800	(1)	(1)	200	(1)
Other	11,200	(1)	100	(1)	100	(1)	(1)	(1)
Non-profit organizations	600	(1)	500	200	(1)	200	300	100
Federal gov't	300	(1)	3,800	1,500	(1)	(1)	300	200
Military	200	(1)	100	(1)	(1)	(1)	400	(1)
State/local/other gov't	500	(1)	4,400	500	400	100	500	(1)
Other	100	(1)	200	100	(1)	(1)	100	(1)
No report	(1)	(1)	200	100	(1)	(1)	(1)	1,300
Chemists	25,800	3,000	31,700	3,100	3,900	200	1,400	1,000
Business/industry	400	3,000	23,900	2,100	3,900	(1)	900	(1)
Industry	400	600	20,000	1,500	2,500	(1)	800	(1)
Self-employed	(1)	2,400	3,900	500	1,300	(1)	100	(1)
Educational institutions	24,400	(1)	200	100	(1)	(1)	(1)	(1)
4-year colleges/univ.	19,500	(1)	200	100	(1)	(1)	(1)	(1)
Other	4,900	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	500	(1)	300	100	(1)	200	100	100
Federal gov't	(1)	(1)	2,800	300	(1)	(1)	100	200
Military	100	(1)	100	(1)	(1)	(1)	200	(1)
State/local/other gov't	400	(1)	3,800	400	(1)	(1)	200	(1)
Other	(1)	(1)	100	100	(1)	(1)	(1)	(1)
No report	(1)	(1)	200	(1)	(1)	(1)	(1)	600
Physicists/astronomers	16,000	1,000	1,800	2,500	300	(1)	800	500
Business/industry	100	1,000	900	1,500	300	(1)	300	(1)
Industry	100	200	800	1,200	200	(1)	200	(1)
Self-employed	(1)	800	200	300	100	(1)	100	(1)
Educational institutions	15,700	(1)	100	900	(1)	(1)	100	(1)
4-year colleges/univ.	13,700	(1)	100	800	(1)	(1)	100	(1)
Other	2,000	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	100	(1)	200	100	(1)	(1)	200	(1)
Federal gov't	(1)	(1)	300	400	(1)	(1)	(1)	(1)
Military	100	(1)	(1)	(1)	(1)	(1)	100	(1)
State/local/other gov't	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	100	(1)	(1)	(1)	100	(1)
No report	(1)	(1)	100	(1)	(1)	(1)	(1)	500

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Other physical scientists	8,600	1,800	3,300	1,900	900	100	700	200
Business/industry	100	1,800	2,100	900	500	(1)	(1)	(1)
Industry	(1)	900	1,300	700	400	(1)	(1)	(1)
Self-employed	(1)	800	700	200	200	(1)	(1)	(1)
Educational institutions	7,900	(1)	100	(1)	(1)	(1)	(1)	(1)
4-year colleges/univ.	3,600	(1)	100	(1)	(1)	(1)	(1)	(1)
Other	4,300	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	100	(1)	(1)	(1)	(1)	(1)	100	(1)
Federal gov't	300	(1)	500	800	(1)	(1)	200	(1)
Military	100	(1)	100	(1)	(1)	(1)	100	(1)
State/local/other gov't	100	(1)	500	100	400	100	300	(1)
Other	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	100	(1)	(1)	(1)	200
Mathematical scientists	60,400	3,500	6,500	21,200	5,500	(1)	2,300	1,200
Business/industry	400	2,800	4,800	11,400	5,200	(1)	1,600	300
Industry	200	2,000	4,700	9,300	3,400	(1)	1,200	300
Self-employed	200	700	200	2,200	1,900	(1)	400	(1)
Educational institutions	58,800	500	700	1,800	(1)	(1)	400	100
4-year colleges/univ.	36,600	500	700	1,100	(1)	(1)	400	(1)
Other	22,200	(1)	(1)	600	(1)	(1)	(1)	100
Non-profit organizations	100	100	(1)	1,200	(1)	(1)	(1)	(1)
Federal gov't	700	100	500	4,900	(1)	(1)	(1)	(1)
Military	100	(1)	100	300	(1)	(1)	100	(1)
State/local/other gov't	300	(1)	400	1,400	100	(1)	(1)	(1)
Other	(1)	(1)	(1)	100	(1)	(1)	100	(1)
No report	(1)	(1)	(1)	(1)	200	(1)	(1)	900
Mathematicians	57,200	2,500	5,800	11,000	5,300	(1)	1,600	1,100
Business/industry	400	2,400	4,200	7,000	5,000	(1)	1,000	200
Industry	200	1,900	4,000	6,200	3,200	(1)	600	200
Self-employed	200	500	200	800	1,900	(1)	400	(1)
Educational institutions	55,600	(1)	700	300	(1)	(1)	400	(1)
4-year colleges/univ.	33,500	(1)	700	200	(1)	(1)	300	(1)
Other	22,100	(1)	(1)	100	(1)	(1)	(1)	(1)
Non-profit organizations	100	100	(1)	400	(1)	(1)	(1)	(1)
Federal gov't	700	100	500	2,000	(1)	(1)	(1)	(1)
Military	100	(1)	100	200	(1)	(1)	100	(1)
State/local/other gov't	300	(1)	400	600	100	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	100	(1)
No report	(1)	(1)	(1)	(1)	200	(1)	(1)	900
Statisticians	3,200	900	700	10,200	200	(1)	700	100
Business/industry	(1)	400	700	4,400	200	(1)	600	100
Industry	(1)	100	700	3,100	200	(1)	600	100
Self-employed	(1)	300	(1)	1,300	(1)	(1)	(1)	(1)
Educational institutions	3,200	500	(1)	1,500	(1)	(1)	(1)	100
4-year colleges/univ.	3,200	500	(1)	1,000	(1)	(1)	(1)	(1)
Other	100	(1)	(1)	600	(1)	(1)	(1)	100
Non-profit organizations	(1)	(1)	(1)	800	(1)	(1)	(1)	(1)
Federal gov't	(1)	100	100	2,300	(1)	(1)	(1)	(1)
Military	(1)	(1)	(1)	100	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	(1)	900	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	100	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Computer specialists	24,000	41,700	29,700	337,500	10,100	(1)	6,200	6,700
Business/industry	5,100	36,700	25,700	263,500	9,800	(1)	5,100	1,400
Industry	3,700	26,200	18,600	207,500	6,000	(1)	4,500	1,300
Self-employed	1,300	10,600	7,100	56,100	3,800	(1)	600	100
Educational institutions	17,400	2,400	1,000	12,700	100	(1)	100	200
4-year colleges/univ.	11,400	1,400	800	10,800	(1)	(1)	100	200
Other	5,900	900	200	1,900	100	(1)	(1)	(1)
Non-profit organizations	100	1,100	200	10,500	(1)	(1)	200	(1)
Federal gov't	(1)	600	1,300	28,400	(1)	(1)	500	200
Military	300	(1)	600	1,300	100	(1)	100	(1)
State/local/other gov't	1,000	300	700	18,300	100	(1)	100	(1)
Other	(1)	(1)	200	2,000	(1)	(1)	100	(1)
No report	100	300	(1)	800	(1)	(1)	(1)	4,600

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Environmental scientists	9,100	7,500	24,500	7,300	2,800	(1)	2,800	1,800
Business/industry	200	7,200	20,200	3,800	2,600	(1)	1,500	900
Industry	200	3,100	16,000	2,800	1,800	(1)	1,000	300
Self-employed	(1)	4,100	4,200	1,000	800	(1)	600	500
Educational institutions	8,200	(1)	200	200	100	(1)	200	100
4-year colleges/univ.	6,400	(1)	200	200	100	(1)	100	100
Other	1,900	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	100	(1)	(1)	(1)
Federal gov't	400	(1)	2,400	2,200	(1)	(1)	200	100
Military	(1)	(1)	300	200	(1)	(1)	300	(1)
State/local/other gov't	100	200	1,300	600	(1)	(1)	400	(1)
Other	100	(1)	(1)	200	(1)	(1)	100	(1)
No report	(1)	(1)	100	(1)	(1)	(1)	(1)	700
Earth scientists	8,600	6,900	23,000	4,700	2,700	(1)	1,900	1,100
Business/industry	200	6,700	19,900	3,000	2,500	(1)	1,300	400
Industry	200	2,700	15,700	2,200	1,700	(1)	800	300
Self-employed	(1)	4,000	4,200	800	800	(1)	500	100
Educational institutions	7,900	(1)	200	200	100	(1)	200	(1)
4-year colleges/univ.	6,100	(1)	200	100	100	(1)	100	(1)
Other	1,800	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	100	(1)	(1)	(1)
Federal gov't	400	(1)	1,400	800	(1)	(1)	100	100
Military	(1)	(1)	(1)	(1)	(1)	(1)	200	(1)
State/local/other gov't	100	200	1,300	600	(1)	(1)	100	(1)
Other	(1)	(1)	(1)	100	(1)	(1)	100	(1)
No report	(1)	(1)	100	(1)	(1)	(1)	(1)	600
Oceanographers	100	(1)	100	200	(1)	(1)	300	(1)
Business/industry	(1)	(1)	(1)	100	(1)	(1)	100	(1)
Industry	(1)	(1)	(1)	100	(1)	(1)	100	(1)
Self-employed	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Educational institutions	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
4-year colleges/univ.	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	(1)	(1)	100	100	(1)	(1)	(1)	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	(1)	(1)	(1)	(1)	200	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Atmospheric scientists	300	500	1,400	2,400	200	(1)	500	700
Business/industry	(1)	500	300	700	100	(1)	100	500
Industry	(1)	400	300	500	100	(1)	100	100
Self-employed	(1)	100	(1)	200	(1)	(1)	(1)	400
Educational institutions	200	(1)	(1)	(1)	(1)	(1)	(1)	100
4-year colleges/univ.	200	(1)	(1)	(1)	(1)	(1)	(1)	100
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	100	(1)	900	1,300	(1)	(1)	200	100
Military	(1)	(1)	200	200	(1)	(1)	100	(1)
State/local/other gov't	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	100	(1)	(1)	100	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	100
Life scientists	67,500	12,200	49,900	15,400	24,800	8,700	10,600	4,600
Business/industry	1,700	8,700	34,400	5,000	22,800	800	4,100	900
Industry	1,000	3,100	23,600	3,600	14,100	600	2,400	700
Self-employed	700	5,600	10,700	1,400	8,800	200	1,700	200
Educational institutions	61,300	900	1,800	3,500	400	1,900	600	900
4-year colleges/univ.	40,000	900	1,100	2,900	200	600	400	100
Other	21,200	(1)	700	600	200	1,300	200	800
Non-profit organizations	1,400	200	1,300	1,200	400	4,500	2,300	200
Federal gov't	500	1,300	5,600	3,100	600	500	1,500	300
Military	(1)	(1)	(1)	(1)	100	(1)	300	100
State/local/other gov't	1,800	1,000	6,200	2,000	400	700	1,300	300
Other	600	(1)	500	600	(1)	100	400	(1)
No report	100	(1)	100	100	100	200	100	2,100

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes-sional services	Other	No report
Biological scientists	53,400	7,200	25,300	10,600	14,500	6,100	5,400	2,400
Business/industry	1,300	5,800	15,000	3,700	13,400	600	1,900	300
Industry	800	2,100	11,400	2,600	8,300	500	1,200	300
Self-employed	500	3,600	3,600	1,100	5,100	100	700	100
Educational institutions	48,900	200	1,000	2,200	200	1,200	400	500
4-year colleges/univ.	33,900	200	600	1,800	(1)	600	200	100
Other	15,000	(1)	400	400	200	600	200	400
Non-profit organizations	900	100	1,000	500	300	3,200	1,700	100
Federal gov't	300	600	4,000	2,300	400	400	700	100
Military	(1)	(1)	(1)	(1)	100	(1)	(1)	100
State/local/other gov't	1,500	500	4,000	1,300	100	600	700	300
Other	500	(1)	300	600	(1)	(1)	100	(1)
No report	100	(1)	(1)	(1)	(1)	200	(1)	1,000
Agricultural scientists	7,100	4,200	23,400	4,500	10,300	900	5,100	1,500
Business/industry	400	2,500	18,500	1,300	9,500	100	2,300	600
Industry	200	1,000	11,300	900	5,800	(1)	1,200	500
Self-employed	200	1,500	7,200	300	3,700	(1)	1,000	100
Educational institutions	5,800	700	800	1,100	200	100	300	(1)
4-year colleges/univ.	4,900	700	500	1,100	200	(1)	200	(1)
Other	900	(1)	300	100	(1)	(1)	100	(1)
Non-profit organizations	200	100	200	700	100	600	600	100
Federal gov't	200	300	1,600	800	200	100	800	100
Military	(1)	(1)	(1)	(1)	(1)	(1)	300	(1)
State/local/other gov't	300	600	2,100	700	200	(1)	500	(1)
Other	100	(1)	200	(1)	(1)	(1)	300	(1)
No report	(1)	(1)	(1)	100	100	(1)	100	700
Medical scientists	7,000	800	1,100	300	(1)	1,700	100	700
Business/industry	(1)	400	800	100	(1)	100	(1)	(1)
Industry	(1)	(1)	800	100	(1)	100	(1)	(1)
Self-employed	(1)	400	(1)	(1)	(1)	(1)	(1)	(1)
Educational institutions	6,600	(1)	(1)	100	(1)	700	(1)	400
4-year colleges/univ.	1,300	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	5,300	(1)	(1)	100	(1)	700	(1)	400
Non-profit organizations	300	(1)	100	(1)	(1)	700	(1)	(1)
Federal gov't	(1)	400	100	(1)	(1)	(1)	(1)	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	(1)	(1)	(1)	100	100	(1)
Other	(1)	(1)	(1)	(1)	(1)	100	(1)	(1)
No report	(1)	(1)	100	(1)	(1)	(1)	(1)	300
Psychologists	42,500	8,000	10,600	6,800	24,000	78,600	7,100	3,600
Business/industry	2,300	5,200	7,200	3,500	23,000	26,800	3,500	1,200
Industry	300	1,300	5,200	1,800	14,400	2,000	2,500	400
Self-employed	2,000	4,000	2,000	1,800	8,600	24,700	1,000	800
Educational institutions	32,600	1,300	1,600	1,100	(1)	19,600	400	600
4-year colleges/univ.	24,500	(1)	200	1,100	(1)	1,900	100	400
Other	8,200	1,300	1,400	(1)	(1)	17,700	300	200
Non-profit organizations	4,800	800	900	1,400	600	23,200	2,100	(1)
Federal gov't	500	(1)	300	400	(1)	1,400	200	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	100	(1)
State/local/other gov't	1,600	800	400	300	300	7,300	700	(1)
Other	100	(1)	200	(1)	200	200	200	(1)
No report	500	(1)	(1)	(1)	(1)	(1)	(1)	1,800
Social scientists	92,400	22,200	25,200	52,800	67,600	2,400	23,500	5,200
Business/industry	1,800	17,600	17,700	26,700	64,100	500	13,500	2,500
Industry	600	10,000	12,800	17,500	37,200	(1)	10,200	1,300
Self-employed	1,200	7,600	5,000	9,200	26,900	500	3,300	1,100
Educational institutions	86,300	300	400	3,200	300	(1)	700	600
4-year colleges/univ.	70,200	300	400	2,900	300	(1)	600	600
Other	16,100	(1)	(1)	300	(1)	(1)	100	(1)
Non-profit organizations	1,000	600	500	4,200	800	1,500	3,000	400
Federal gov't	400	900	1,600	7,900	700	(1)	1,000	100
Military	400	(1)	400	(1)	(1)	(1)	400	(1)
State/local/other gov't	1,500	2,600	3,800	9,900	1,400	200	4,800	(1)
Other	1,000	100	700	1,100	300	200	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1,500

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Economists	30,200	12,600	10,800	28,200	29,100	(1)	8,400	2,600
Business/industry	600	10,800	9,000	17,400	27,300	(1)	7,100	1,900
Industry	(1)	6,100	5,900	13,200	14,000	(1)	6,100	1,300
Self-employed	500	4,800	3,100	4,200	13,300	(1)	1,000	600
Educational institutions	28,700	300	(1)	200	300	(1)	(1)	(1)
4-year colleges/univ.	22,900	300	(1)	200	300	(1)	(1)	(1)
Other	5,800	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	200	(1)	(1)	700	300	(1)	300	(1)
Federal gov't	100	500	700	5,800	400	(1)	200	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	200	(1)
State/local/other gov't	200	700	400	3,600	500	(1)	500	(1)
Other	400	100	700	400	200	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	700
Sociologists/anthropologists	22,100	1,700	7,000	7,600	10,900	100	6,200	300
Business/industry	900	500	4,300	2,700	10,300	(1)	1,800	(1)
Industry	300	(1)	3,100	600	6,000	(1)	900	(1)
Self-employed	600	500	1,200	2,200	4,400	(1)	900	(1)
Educational institutions	20,500	(1)	400	1,300	(1)	(1)	400	100
4-year colleges/univ.	18,700	(1)	400	1,200	(1)	(1)	400	100
Other	1,700	(1)	(1)	200	(1)	(1)	(1)	(1)
Non-profit organizations	300	200	100	1,900	(1)	(1)	500	100
Federal gov't	(1)	(1)	300	400	(1)	(1)	400	100
Military	(1)	(1)	200	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	100	900	1,700	1,100	500	(1)	3,200	(1)
Other	300	(1)	(1)	100	(1)	100	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other social scientists	40,100	8,000	7,400	17,000	27,600	2,300	8,900	2,300
Business/industry	300	6,200	4,500	6,500	26,400	500	4,600	500
Industry	200	3,900	3,800	3,700	17,200	(1)	3,200	100
Self-employed	(1)	2,400	700	2,800	9,200	500	1,400	400
Educational institutions	37,100	(1)	(1)	1,600	(1)	(1)	300	600
4-year colleges/univ.	28,600	(1)	(1)	1,500	(1)	(1)	200	600
Other	8,500	(1)	(1)	100	(1)	(1)	100	(1)
Non-profit organizations	500	400	400	1,600	500	1,500	2,300	300
Federal gov't	300	400	600	1,600	300	(1)	400	100
Military	400	(1)	200	(1)	(1)	(1)	200	(1)
State/local/other gov't	1,300	900	1,800	5,200	400	200	1,100	(1)
Other	200	(1)	(1)	500	(1)	100	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	800
Total engineers	64,500	187,700	486,400	131,900	101,000	900	30,100	34,800
Business/industry	8,800	174,300	387,500	102,300	96,900	300	18,500	7,800
Industry	6,900	116,500	328,800	86,500	75,400	300	14,600	5,400
Self-employed	1,900	57,800	58,700	15,900	21,500	(1)	3,900	2,300
Educational institutions	50,700	900	8,100	2,500	600	300	600	600
4-year colleges/univ.	40,200	800	6,100	2,300	300	(1)	500	200
Other	10,400	100	2,000	200	300	300	100	400
Non-profit organizations	600	3,100	6,300	2,300	100	200	400	100
Federal gov't	1,200	4,600	39,800	13,000	1,600	(1)	2,800	1,000
Military	1,600	200	5,200	1,400	(1)	(1)	4,300	100
State/local/other gov't	800	2,900	35,700	9,400	1,500	(1)	2,600	900
Other	200	1,100	1,800	700	(1)	(1)	800	200
No report	500	600	1,900	300	100	(1)	100	24,100
Aeronautical/astronautical	3,700	3,100	12,700	6,800	1,700	200	4,300	2,200
Business/industry	400	2,600	8,700	5,600	1,700	(1)	1,500	100
Industry	300	1,100	7,200	4,500	1,000	(1)	1,100	100
Self-employed	100	1,500	1,500	1,200	700	(1)	400	(1)
Educational institutions	2,400	(1)	(1)	(1)	(1)	(1)	100	(1)
4-year colleges/univ.	2,300	(1)	(1)	(1)	(1)	(1)	100	(1)
Other	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	200	300	100	(1)	200	(1)	(1)
Federal gov't	(1)	200	2,100	800	(1)	(1)	600	(1)
Military	400	(1)	1,200	300	(1)	(1)	2,000	(1)
State/local/other gov't	(1)	(1)	300	(1)	(1)	(1)	(1)	100
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	2,000

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/inspection	Reporting, Stat work, Computing	Sales	Profes-sional services	Other	No report
Chemical	3,300	7,200	23,900	5,100	4,900	(1)	1,300	2,600
Business/industry	200	6,800	22,500	4,400	4,700	(1)	1,000	1,400
Industry	200	3,300	19,200	3,500	3,400	(1)	800	700
Self-employed	(1)	3,500	3,300	900	1,300	(1)	200	700
Educational institutions	3,000	(1)	100	100	100	(1)	100	(1)
4-year colleges/univ.	2,400	(1)	100	100	100	(1)	100	(1)
Other	600	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	400	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	(1)	(1)	700	200	100	(1)	100	(1)
Military	(1)	(1)	200	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	300	300	(1)	(1)	100	(1)
Other	(1)	(1)	200	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1,200
Civil	6,500	59,600	77,000	15,300	5,000	300	4,400	5,000
Business/industry	700	56,400	44,900	7,400	4,100	100	2,100	1,500
Industry	600	38,700	36,500	5,300	2,800	100	1,600	1,100
Self-employed	(1)	17,800	8,400	2,100	1,300	(1)	500	400
Educational institutions	4,100	200	900	200	100	200	100	(1)
4-year colleges/univ.	3,500	200	700	100	(1)	(1)	100	(1)
Other	600	(1)	300	100	100	200	(1)	(1)
Non-profit organizations	100	200	300	100	100	(1)	100	(1)
Federal gov't	100	600	8,100	2,600	(1)	(1)	500	100
Military	600	100	500	100	(1)	(1)	200	(1)
State/local/other gov't	600	1,600	21,800	4,700	500	(1)	1,300	600
Other	(1)	200	300	100	(1)	(1)	200	(1)
No report	400	200	100	(1)	100	(1)	(1)	2,700
Electrical/electronics	15,900	25,500	97,200	26,200	12,200	100	5,500	7,000
Business/industry	2,300	23,900	81,000	20,100	11,300	100	4,200	1,400
Industry	1,600	16,500	64,500	16,700	7,400	(1)	3,100	1,300
Self-employed	700	7,500	16,400	3,500	4,000	(1)	1,100	100
Educational institutions	12,900	100	2,200	200	(1)	(1)	100	100
4-year colleges/univ.	8,800	(1)	1,500	200	(1)	(1)	100	100
Other	4,100	100	700	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	100	1,600	800	(1)	(1)	100	(1)
Federal gov't	600	1,100	8,700	3,900	600	(1)	600	300
Military	100	(1)	800	700	(1)	(1)	300	(1)
State/local/other gov't	(1)	200	1,700	100	100	(1)	100	(1)
Other	(1)	(1)	200	200	(1)	(1)	(1)	100
No report	(1)	100	1,000	100	(1)	(1)	100	5,200
Industrial	4,500	8,800	46,700	13,000	5,800	(1)	1,700	1,500
Business/industry	300	7,200	43,100	11,600	5,300	(1)	1,500	600
Industry	200	4,700	37,500	10,600	3,800	(1)	1,400	600
Self-employed	100	2,600	5,500	1,000	1,500	(1)	100	(1)
Educational institutions	4,000	100	500	200	(1)	(1)	(1)	(1)
4-year colleges/univ.	3,200	100	300	200	(1)	(1)	(1)	(1)
Other	800	(1)	100	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	700	(1)	200	(1)	(1)	(1)	100
Federal gov't	100	400	2,300	900	200	(1)	100	(1)
Military	(1)	(1)	100	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	100	300	600	(1)	200	(1)	(1)	(1)
Other	(1)	(1)	100	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	700
Materials	2,100	1,500	13,100	1,100	2,100	(1)	500	700
Business/industry	100	1,400	11,900	800	2,100	(1)	500	(1)
Industry	100	800	10,600	600	2,000	(1)	500	(1)
Self-employed	(1)	600	1,300	300	100	(1)	(1)	(1)
Educational institutions	1,900	(1)	100	(1)	(1)	(1)	(1)	(1)
4-year colleges/univ.	1,900	(1)	100	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	100	(1)	(1)	(1)	(1)
Federal gov't	100	100	800	(1)	(1)	(1)	(1)	200
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	200	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	100	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	500

See footnotes at end of table.

Table 5. Employed scientists and engineers by field, sector of employment, and primary work activity: 1988-Continued

Field and Sector of Employment	Primary work activity							
	Teaching	Consulting	Production/ inspection	Reporting, Stat work, Computing	Sales	Profes- sional services	Other	No report
Mechanical	9,500	22,200	73,700	13,700	10,800	100	3,300	5,100
Business/industry	900	20,900	61,800	11,400	10,600	100	2,500	1,900
Industry	600	14,000	53,900	9,300	8,200	100	1,900	800
Self-employed	300	6,900	8,000	2,100	2,400	(1)	600	1,100
Educational institutions	8,100	100	1,700	200	100	(1)	100	400
4-year colleges/univ.	6,000	100	1,300	200	100	(1)	100	(1)
Other	2,100	(1)	500	(1)	(1)	(1)	(1)	400
Non-profit organizations	100	100	1,700	100	(1)	(1)	(1)	(1)
Federal gov't	100	600	6,600	1,100	(1)	(1)	400	100
Military	200	(1)	400	(1)	(1)	(1)	200	(1)
State/local/other gov't	(1)	100	1,100	600	(1)	(1)	100	(1)
Other	(1)	300	100	100	(1)	(1)	100	(1)
No report	100	100	300	200	(1)	(1)	(1)	2,600
Mining	800	2,400	7,200	1,500	600	(1)	100	200
Business/industry	(1)	2,300	6,600	900	600	(1)	100	(1)
Industry	(1)	1,000	5,900	700	500	(1)	100	(1)
Self-employed	(1)	1,300	800	200	100	(1)	(1)	(1)
Educational institutions	800	(1)	(1)	100	(1)	(1)	(1)	(1)
4-year colleges/univ.	800	(1)	(1)	100	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	(1)	100	300	200	(1)	(1)	(1)	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	200	100	(1)	(1)	(1)	(1)
Other	(1)	(1)	100	100	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	200
Nuclear	1,200	2,400	7,800	2,500	800	(1)	1,000	100
Business/industry	200	2,300	4,200	1,900	700	(1)	300	(1)
Industry	200	2,000	4,000	1,800	700	(1)	200	(1)
Self-employed	(1)	400	200	200	(1)	(1)	(1)	(1)
Educational institutions	800	(1)	100	(1)	(1)	(1)	(1)	(1)
4-year colleges/univ.	100	(1)	100	(1)	(1)	(1)	(1)	(1)
Other	700	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Federal gov't	(1)	100	2,700	500	100	(1)	(1)	(1)
Military	100	(1)	700	(1)	(1)	(1)	700	(1)
State/local/other gov't	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	100	(1)	(1)	(1)	(1)	(1)
Petroleum	300	3,800	16,100	2,000	1,500	(1)	300	600
Business/industry	200	3,700	15,400	1,300	1,500	(1)	200	(1)
Industry	100	2,400	12,800	1,000	1,300	(1)	200	(1)
Self-employed	(1)	1,200	2,600	300	100	(1)	(1)	(1)
Educational institutions	100	(1)	100	(1)	(1)	(1)	(1)	(1)
4-year colleges/univ.	100	(1)	100	(1)	(1)	(1)	(1)	(1)
Other	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Non-profit organizations	(1)	(1)	(1)	100	(1)	(1)	(1)	(1)
Federal gov't	(1)	(1)	500	(1)	(1)	(1)	(1)	(1)
Military	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
State/local/other gov't	(1)	(1)	(1)	600	(1)	(1)	(1)	(1)
Other	(1)	100	(1)	(1)	(1)	(1)	(1)	(1)
No report	(1)	(1)	(1)	(1)	(1)	(1)	(1)	600
Other engineers	17,200	51,300	111,000	44,800	55,700	200	7,600	9,900
Business/industry	3,600	46,700	87,400	36,800	54,400	100	4,600	900
Industry	2,900	32,100	76,700	32,600	44,300	100	3,800	800
Self-employed	700	14,600	10,700	4,200	10,100	(1)	800	(1)
Educational institutions	12,500	400	2,300	1,300	300	100	100	100
4-year colleges/univ.	11,200	400	1,900	1,300	100	(1)	(1)	100
Other	1,400	(1)	400	100	200	100	100	(1)
Non-profit organizations	400	1,400	2,300	800	(1)	(1)	200	(1)
Federal gov't	100	1,400	7,000	2,800	500	(1)	500	100
Military	300	(1)	1,300	200	(1)	(1)	800	(1)
State/local/other gov't	100	600	9,600	2,900	600	(1)	1,000	100
Other	200	500	800	100	(1)	(1)	500	100
No report	(1)	100	400	(1)	(1)	(1)	(1)	8,500

(1) Too few cases to estimate.

NOTE: Detail may not add to total because of rounding.
SOURCE: National Science Foundation, SRS.

Table 6. Selected employment characteristics of scientists and engineers by field: 1988

Field	Selected Characteristic	
	Labor force participation rate	Unemployment rate
Total, all fields	94.8	1.5
Total scientists	95.4	1.7
Physical scientists	93.7	1.4
Chemists	92.9	1.4
Physicists/astronomers	94.9	1.2
Other physical scientists	94.9	2.1
Mathematical scientists	95.1	0.9
Mathematicians	94.9	1.0
Statisticians	96.4	0.7
Computer specialists	98.4	1.0
Environmental scientists	94.3	4.2
Earth scientists	94.0	4.9
Oceanographers	92.9	0.2
Atmospheric scientists	96.9	0.5
Life scientists	93.1	1.9
Biological scientists	92.8	1.9
Agricultural scientists	93.5	2.4
Medical scientists	93.9	0.4
Psychologists	94.6	2.2
Social scientists	95.5	2.1
Economists	96.3	2.9
Sociologists/anthropologists	94.4	1.9
Other social scientists	95.2	1.4
Total engineers	94.2	1.2
Aeronautical/astronautical	95.2	0.5
Chemical	89.5	2.5
Civil	92.5	1.6
Electrical/electronics	93.9	1.1
Industrial	96.1	1.1
Materials	93.8	1.8
Mechanical	91.5	1.4
Mining	93.6	2.1
Nuclear	97.7	0.7
Petroleum	95.3	3.6
Other engineers	98.2	0.7

SOURCE: National Science Foundation, SRS.

SECTION C. SURVEY QUESTIONNAIRES

Page

1986 National Survey of Natural and Social Scientists and Engineers....31

1988 Survey of Natural and Social Science and Engineering Graduates....41

OMB No. 3145-0071: Approval Expires January 31, 1988

NOTICE — Your report to the Census Bureau is **confidential** by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes.

FROM THE DIRECTOR
BUREAU OF THE CENSUS

The Bureau of the Census is again conducting the National Survey of Natural and Social Scientists and Engineers to update information relating to the Nation's scientific and technical personnel. We conduct this survey every 2 years under the sponsorship of the National Science Foundation and the Department of Energy. We appreciate your cooperation in 1984 and are again asking for your assistance. Even if you are retired, not working, or currently working in a position unrelated to science or engineering, we urge you to complete the questionnaire to add to the knowledge of our Nation's use of highly trained and educated personnel.

Because of the rapid developments and innovations in science and technology during recent years, it is important to know how these changes affect the highly trained and educated people in the fields of engineering, and the natural and social sciences. The National Science Foundation uses the information collected in this survey as mandated by law to prepare biennial reports, which provide numbers and characteristics of the scientific and technical population. The survey data enable government agencies to assess the scientific and engineering resources available in the United States in relation to the needs of businesses, industries, and universities and to provide a basis for the Nation's science and engineering policies.

We are collecting this information under the authority of the National Science Foundation Act of 1950, as amended by Title 42, United States Code, Section 1862. Title 13, United States Code, obligates the Census Bureau to keep all information provided by respondents in the strictest confidence. We can only use your answers to prepare statistical summaries. Such summaries preclude the identification of any survey participant.

Please answer the questions that begin on page 2 and return your questionnaire in the enclosed, addressed envelope as soon as possible. Some questions ask you to enter a code and description from Reference List A, B, or C. We are enclosing a Reference List Guide for your use. Participation in this survey is voluntary, and there are no penalties for failing to answer questions. However, your cooperation is vital to ensure the completeness and accuracy of final results.

Thank you for your cooperation. Your Census Bureau appreciates your help.

Sincerely,

John G. Keane

JOHN G. KEANE

Enclosures

FORM **SSE-60**
(1-24-86)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

1986 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS

001 1

PLEASE COMPLETE AND RETURN TO

Bureau of the Census
ATTN: Current Projects Branch
1201 East Tenth Street
Jeffersonville, Indiana 47132

Please read instructions carefully before answering questions.

Answer as accurately as you can by printing your reply clearly or by entering an "X" in the box next to the appropriate reply.

If the instructions for a question direct you to enter a code and description from a list, please refer to the Reference List Guide that is enclosed.

IF YOU HAVE MOVED, or if there are errors in the address label above, please enter the correct information about your name and current residence below.

Name

Number and street

City or town

State or foreign country **002** ☐☐☐ ZIP Code

Part I — EDUCATION AND TRAINING

1. Since May 1984 have you attended any college, university, or other post high school institution?

101 1 ☐ Yes — *GO to 2a*
2 ☐ No — *GO to 4*

2a. What is the highest degree, if any, you have RECEIVED since May 1984?

Mark (X) only one box.

102 1 ☐ Associate
2 ☐ Registered Nurse (R.N.)
3 ☐ Bachelor's
4 ☐ Master's
5 ☐ First Professional Non-Medical (e.g., J.D., LL.B., Th.B.)
6 ☐ First Professional Medical (e.g., D.D.M., D.D.S., D.O., D.V.M., M.D.)
7 ☐ Doctorate
8 ☐ Other — *Specify* — ____________________

} *GO to 2b*

9 ☐ None — *GO to 3a*

b. When was this degree awarded?

If you received more than one degree at the same level (e.g., two master's degrees), enter the year of award of the most recent one.

103 19 _____

c. What was the major field of study for this degree?

Enter code and description from Reference List A.

104

Code		

Description from Reference List A ↴ ____________________

3a. Are you currently attending a college or university?

105 1 ☐ Yes — *GO to 3b*
2 ☐ No — *GO to 4*

b. Are you a full-time or part-time student?

106 1 ☐ Full-time
2 ☐ Part-time

3c. Are you enrolled as a graduate or an undergraduate student?

107 1 ☐ Graduate
2 ☐ Undergraduate

d. What field of study are you pursuing?

Enter code and description from Reference List A.

108

Code		

Description from Reference List A ↴ ____________________

☐ Not pursuing a specific field of study

4. Which of the following kinds of training, if any, did you participate in during 1984 or 1985?

Mark (X) the appropriate year for each type of training you received.

(1) Courses at your employer's training facility.

109 * 1984 1 ☐ 110 * 1985 1 ☐

(2) Courses at an adult education center.

1984 2 ☐ 1985 2 ☐

(3) Courses presented in conjunction with professional meetings.

1984 3 ☐ 1985 3 ☐

(4) Courses presented by professional training organizations (commercial or non-profit).

1984 4 ☐ 1985 4 ☐

(5) Extension or correspondence courses.

1984 5 ☐ 1985 5 ☐

(6) Military training.

1984 6 ☐ 1985 6 ☐

(7) Other training.

1984 7 ☐ 1985 7 ☐

(8) None

1984 8 ☐ 1985 8 ☐

PART II — DEMOGRAPHIC CHARACTERISTICS

5. As of March 9, 1986, what was your marital status?

111 1 ☐ Married
2 ☐ Widowed
3 ☐ Separated
4 ☐ Divorced
5 ☐ Never married

6a. Did you have any children living with you as of March 9, 1986 who were 6 - 17 years of age?

112 1 ☐ Yes
2 ☐ No

b. Did you have any children living with you as of March 9, 1986 who were under 6 years of age?

113 1 ☐ Yes
2 ☐ No

7a. Are you physically handicapped?

114 1 ☐ Yes — *GO to 7b*
2 ☐ No — *GO to 8*

b. What is the nature of your handicap(s)?

Mark (X) all that apply.

115 1 ☐ Visual
2 ☐ Auditory
3 ☐ Ambulatory
4 ☐ Other — *Specify* ↴

____

Part III — EMPLOYMENT STATUS

8. During the week of March 9, 1986, were you —

116 1 ☐ Working full time (35 hours or more per week in at least one position) — *GO to 13a*
2 ☐ Working part time — *GO to 9*
3 ☐ Not working, but seeking work — *GO to 12*
4 ☐ Not working and not seeking work — *GO to 10*

9. Were you seeking full-time work?

117 1 ☐ Yes
2 ☐ No
} *GO to 13a*

10. Did you look for work at any time during the 3 weeks PRIOR to the week of March 9, 1986?

118 1 ☐ Yes
2 ☐ No

11. What was the MAIN reason you were not working and not seeking work during the week of March 9, 1986?

Mark (X) only one box.

119 1 ☐ On vacation or otherwise temporarily absent from a job for health or personal reasons } *GO to 13a*
2 ☐ On layoff from a job
3 ☐ Retired
4 ☐ Student
5 ☐ Family responsibilities
6 ☐ Chronic illness or permanent disability
7 ☐ Could not find work or believed no jobs available in my particular field
8 ☐ Did not want to work
9 ☐ New job to begin within 30 days
10 ☐ Waiting for school to begin
11 ☐ Other — *Specify* ↴

____

____

} *GO to 23, page 5*

12. If you were not working but were seeking work during the week of March 9, 1986, was your job search restricted by —

120 1 ☐ Geographic location
2 ☐ Family responsibilities
3 ☐ Need for part-time employment
4 ☐ Other — *Specify* ↴

____

5 ☐ Not restricted

} *GO to 23, page 5*

13a. During the week of March 9, 1986, were you working at (or temporarily absent from) a position related to the natural sciences, social sciences, or engineering?

121 1 ☐ Yes — *GO to 14a*
2 ☐ No — *GO to 13b*

b. What was the most important reason that you were NOT working at a position related to science or engineering?

Mark (X) only one box.

122 1 ☐ Preferred nonscience or nonengineering position
2 ☐ Promoted out of science or engineering position
3 ☐ Pay was better in nonscience or nonengineering position
4 ☐ Locational preference
5 ☐ Science or engineering position not available
6 ☐ Other — *Specify* ↴

____

____

PART IV — EMPLOYMENT PROFILE

In this part of the questionnaire, we are asking questions about your job held during the week of March 9, 1986, regardless of the type of work involved (including a military service job). If you had more than one regular job during the week of March 9, 1986, record information for the one which you consider to be your PRINCIPAL employment.

14a. For whom did you work?

Enter name of company, business organization, government agency, or other employer (or self-employed). ↴

____

____

____

b. In what city and state did you work?

City or town	State or foreign country	123			

15a. How would you classify the organization for which you work?

(Please enter code from Reference List B, "Employer Classification List". If the organization conducts its activities at different locations, enter the code for the activity at the location where you are employed.)

124

Code		

b. What kind of work were you doing?

Enter the code and description of your occupation from Reference List C.

125

Code		

Description from Reference List C ↴ ____________________

16. Which category best describes the type of organization of this job?

Mark (X) only one box.

126

- 01 ☐ Self-employed
- 02 ☐ Business or industry
- 03 ☐ Junior college, 2-year college, technical institute
- 04 ☐ Medical school
- 05 ☐ 4-year college or university, other than medical school
- 06 ☐ Elementary or secondary school system
- 07 ☐ Hospital or clinic
- 08 ☐ Non-profit organization, other than hospital, clinic, or educational institution
- 09 ☐ U.S. military service (active duty), or Commissioned Corps, e.g., USPHS, NOAA
- 10 ☐ U.S. Government, civilian employee
- 11 ☐ State government
- 12 ☐ Local or other government — *Specify* ↴ ____________________
- 13 ☐ International agency
- 14 ☐ Other — *Specify* ↴ ____________________

17a. Did you have more than one job during the week of March 9, 1986?

127

- 1 ☐ Yes — *GO to 17b*
- 2 ☐ No — *GO to 18*

b. Which one of the categories in item 16 above best describes the type of organization of your second job?

Enter the appropriate code (01 — 14) from item 16 above.

128 ☐☐ Second job

Remarks

PART IV — EMPLOYMENT PROFILE — Continued

18. From the following work activities, which was your primary work activity and which was your secondary work activity for your job reported in item 14, in terms of time devoted for a typical week?

Enter the appropriate code (01 – 16) for each in the specified box.

PLEASE NOTE: **Basic research** is study directed toward gaining scientific knowledge primarily for its own sake.

Applied research is study directed toward gaining scientific knowledge in an effort to meet a recognized need.

Development is direction of the knowledge gained from research toward production of useful materials, devices, systems, and methods.

Code

01 —Management or administration of research and development
02 —Management or administration of other than research and development
03 —Teaching and training — preparing and teaching courses, guiding and counseling students or trainees
04 —Basic research
05 —Applied research
06 —Development — product, process, and technical development
07 —Report and technical writing, editing, information retrieval
08 —Clinical diagnosis, psychotherapy
09 —Design of equipment, processes, models
10 —Quality control, testing, evaluation, or inspection
11 —Operations — production, maintenance, construction, installation, exploration
12 —Distribution — sales, traffic, purchasing, customer and public relations
13 —Statistical work — survey work, forecasting, statistical analysis
14 —Consulting
15 —Computer applications
16 —Other activities — *Specify* ↴

____

129 ☐☐ Primary work activity

130 ☐☐ Secondary work activity

19. During a typical week in your job reported in item 14, what percent of working time did you devote to each of these activities?

Entries should total 100%.

131 ________ % Primary work activity
132 ________ % Secondary work activity
133 ________ % Other activities
100.0 **TOTAL**

20a. For your job reported in item 14, what was your basic annual salary as of March 1986?

Exclude bonuses, overtime, summer teaching, etc.

134 $ ______________ . 00 Per year
0 ☐ None

b. Were you employed by an educational institution?

135 1 ☐ Yes — *GO to 20c*
2 ☐ No — *GO to 21*

c. Was your salary paid on a 9 or 10 month basis or an 11 or 12 month basis?

136 1 ☐ 9–10 months
2 ☐ 11–12 months

21. What was your basic annual salary in 1985 for your job reported in item 14?

Exclude bonuses, overtime, summer teaching, etc.

137 $ ______________ . 00 Per year
0 ☐ None

22. What was your total professional income in 1985 including basic annual salary, bonuses, overtime, summer teaching, consulting fees, etc.?

138 $ ______________ . 00 In 1985
0 ☐ None

23. During calendar year 1985 —

(a) How many weeks did you work? *Include weeks of paid vacation, paid sick leave, and military service.*

139 ________ Weeks

(b) How many weeks were you without a job, but seeking work?

140 ________ Weeks

(c) How many weeks were you not working and not seeking work?

141 ________ Weeks

52 Weeks *Entries for (a), (b) and (c) above should total 52 weeks.*

PART IV — EMPLOYMENT PROFILE — Continued

24. How many years of professional work experience, including teaching, have you had?

142 ______ Years

0 ☐ None

25. Based on your total education and experience, what do you regard yourself as professionally? (If retired, prior to retirement.)

Enter code and description from Reference List C.

143 Code ☐☐☐ Description from Reference List C ↴ ______________________

26a. During the week of March 9, 1986, was any of your work at your job reported in item 14 supported by U.S. Government funds? (If retired or unemployed during that week, skip to item 29.)

144
1 ☐ Yes — *GO to 26b*
2 ☐ No } *GO to 27*
3 ☐ Don't know } *GO to 27*

b. Which of these agencies or departments were supporting your work? *Mark (X) all that apply.*

145
1 ☐ AID (Agency for International Development)
2 ☐ Department of Agriculture
3 ☐ Department of Commerce
4 ☐ Department of Defense
5 ☐ Department of Energy
6 ☐ Department of Education (NIE, OE, NCES)
7 ☐ Department of Health and Human Services
8 ☐ Department of Housing and Urban Development
9 ☐ Department of the Interior
10 ☐ Department of Justice
11 ☐ Department of Labor
12 ☐ Department of Transportation
13 ☐ EPA (Environmental Protection Agency)
14 ☐ NASA (National Aeronautics and Space Administration)
15 ☐ NSF (National Science Foundation)
16 ☐ Nuclear Regulatory Commission
17 ☐ Other — *Specify* ↴ ______________________
18 ☐ Don't know source agency

27. From this list of selected areas of national interest, indicate the ONE area to which you devoted the MOST professional time during a typical week at the job reported in item 14. *Mark (X) only one box.*

146
1 ☐ Energy and fuel — *GO to 28a*
2 ☐ Health
3 ☐ Environment
4 ☐ Education
5 ☐ National defense
6 ☐ Agriculture
7 ☐ Mineral resources
8 ☐ Community development and service
9 ☐ Housing (planning, design, construction)
10 ☐ Transportation
11 ☐ Communications
12 ☐ Technological development
13 ☐ Space
14 ☐ Other — *Specify* ______________________ ______________________

} *GO to 29a* (items 2–14)

28a. What percent of your professional time did you devote to energy and fuel during a typical week?

147
1 ☐ 100 percent
2 ☐ 75 to 99 percent
3 ☐ 50 to 74 percent
4 ☐ 25 to 49 percent
5 ☐ 24 percent or less

b. From this list, mark the ONE energy source that involved the LARGEST proportion of your energy-related work during a typical week.

148
1 ☐ Coal and coal products
2 ☐ Petroleum (including oil shale and tar sands) or natural gas
3 ☐ Fission
4 ☐ Fusion
5 ☐ Hydroenergy
6 ☐ Direct solar (including space and water heating, thermal, electric)
7 ☐ Indirect solar (winds, tides, biomass, etc.)
8 ☐ Geothermal
9 ☐ Other — *Specify* ↴ ______________________

c. Please read this list of energy-related activities and mark the item(s) that best describe the activity(ies) in which you were engaged during a typical week at the job reported in item 14. *Mark (X) all that apply.*

149
01 ☐ Exploration
02 ☐ Extraction (gas, oil, mining)
03 ☐ Manufacture of energy-related components or products
04 ☐ Fuel processing (including refining and enriching)
05 ☐ Electric power generation
06 ☐ Transportation, transmission, distribution of fuel or energy
07 ☐ Energy storage
08 ☐ Energy utilization, management
09 ☐ Fuel reprocessing or disposal
10 ☐ Energy conservation
11 ☐ Environmental impact (health, economic, etc.)
12 ☐ Education, training
13 ☐ Other — *Specify* ↴ ______________________

d. Please enter the number of the activity from the above list (28c) that best describes the activity in which you spent MOST of your energy-related time.

Enter the appropriate code number (01 to 13) from item 28c above.

150 ☐☐ Activity

Part V — OTHER INFORMATION

29a. In the event it is necessary to contact you to clarify some of the information you provided, may we contact you by telephone?

1 ☐ Yes — *GO to 29b*
2 ☐ No — *GO to 30*

b. What is the telephone number at which you can be reached?

151

Area code	Number

c. What is an alternate telephone number at which you can be reached?

152

Area code	Number

30. Please enter the name and address of a person, other than yourself and at an address other than yours, through whom you can be reached.

153

Name	
Number and street	
City or town	
State or foreign country	ZIP code

Remarks

Thank you for completing this questionnaire.
Please return the completed form in the enclosed addressed envelope.

☆U. S. GOVERNMENT PRINTING OFFICE: 1986/646-009/20214

FORM **SSE-65**
(12-13-85)

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

REFERENCE LIST GUIDE

1986 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS

REFERENCE LIST A — MAJOR FIELDS OF STUDY

This list is to be used in answering questions 2c and 3d about the field in which you are studying or have obtained a degree. It is a list of fields of academic study generally leading to bachelor's or higher degrees.

Please scan the entire list, choose the appropriate answer for the question, and then enter the code and description in questions 2c and 3d. If none of the categories listed below adequately describes the field in which you are currently studying or have obtained a degree, use the "Other" category (code 241) and enter a brief description of the field of study in the space provided on the questionnaire.

Biological and Agricultural Sciences and Related Fields

Code	Description
101	Agriculture, business
102	Agriculture, general
103	Agronomy, field crops
104	Anatomy, histology
105	Animal physiology
106	Animal science
107	Bacteriology, virology, mycology, parasitology
108	Biochemistry
109	Biology, general
110	Biometrics and biostatistics
111	Biophysics
112	Botany, general
113	Cell biology
114	Dairy sciences (dairy husbandry)
115	Ecology
116	Embryology
117	Entomology
118	Farm management
119	Fish and game or wildlife management
120	Food science (food technology and processing, dairy manufacturing and technology, food industry)
121	Forestry
122	Genetics
123	Horticulture
124	Immunology
125	Marine biology
126	Microbiology
127	Molecular biology
128	Natural resources management
129	Neurosciences
130	Nutrition
131	Pathology, human and animal
132	Pathology, plant
133	Physiology, human and animal
134	Physiology, plant
135	Poultry sciences
136	Radiology
137	Soil sciences (soil management, soil conservation)
138	Toxicology
139	Zoology, general
140	Biological and agricultural sciences, other fields

Education

Code	Description
141	Biological sciences education
142	Guidance and counseling
143	Mathematics education
144	Physical sciences education
145	Social sciences education
146	Education, other fields

Engineering

Code	Description
147	Aerospace, aeronautical, astronautical and related fields
148	Agricultural
149	Architectural
150	Bioengineering and biomedical engineering
151	Chemical, petroleum refining

Engineering *(Continued)*

Code	Description
152	Civil, construction, transportation
153	Computer
154	Electrical, electronics, communications
155	Engineering sciences, mechanics, physics
156	Engineering technology
157	Environmental, sanitary engineering
158	General or unified
159	Geological engineering
160	Geophysical engineering
161	Industrial
162	Mechanical
163	Metallurgical, materials, ceramics
164	Mining, mineral, geological
165	Naval architecture and marine engineering
166	Nuclear
167	Ocean engineering
168	Petroleum
169	Textile engineering
170	Engineering, other fields

Health Fields

Code	Description
171	Medicine or premedicine, and clinical medical sciences
172	Nursing (4 years or longer program)
173	Pathology
174	Pharmacology
175	Pharmacy
176	Health professions, other fields (4 years or longer)

Mathematical Sciences

Code	Description
177	Actuarial sciences
178	Applied mathematics
179	Computer science
180	Mathematics
181	Operations research/management sciences
182	Statistics

Physical Sciences

Code	Description
183	Analytical chemistry
184	Astronomy
185	Astrophysics
186	Atmospheric sciences and meteorology
187	Atomic—molecular physics
108	Biochemistry
188	Chemistry, general
189	Earth sciences, general
190	Elementary particles and fields
191	Geology
192	Geochemistry
193	Geophysics and seismology
194	Inorganic chemistry
195	Metallurgy
196	Nuclear physics

Physical Sciences *(Continued)*

Code	Description
197	Oceanography
198	Organic chemistry
199	Paleontology
200	Pharmaceutical chemistry
201	Physical chemistry
202	Physical sciences, general
203	Physics, general
204	Solid state physics
205	Other, earth sciences
206	Other, physical sciences

Psychology

Code	Description
207	Clinical
208	Counseling
209	Developmental
210	Educational
211	Experimental
212	Industrial/organizational
213	Physiological
214	Psychology, general
215	Psychometrics
216	Social
217	Psychology, other fields

Social Sciences

Code	Description
218	Anthropology
219	Criminology
220	Economics, agricultural
221	Economics, except agricultural
222	Geography
223	Political science and government
224	Sociology
225	Social sciences, other fields

Arts, Humanities, and Other Specialties

Code	Description
226	Architecture
227	Area studies
228	Arts, general
229	Business and commerce, including accounting, hotel and restaurant administration, and secretarial studies
230	English and journalism
231	Fine and applied arts, all fields
232	Foreign language and literature, all fields
233	History
234	Home economics, all fields
235	Law or prelaw
236	Library science
237	Military science, including merchant marine deck officer
238	Philosophy, all fields
239	Religion and theology, all fields
240	Social work
241	Other *(Describe briefly in the applicable item on questionnaire.)*

REFERENCE LIST B — EMPLOYER CLASSIFICATION LIST

This list is to be used in answering question 15a about the classification of your employer. Please scan the entire list, choose the appropriate answer for the question and enter the code from this list. If none of the categories listed below adequately describes your employer's classification, use the "Other" category (code 436).

Code	Description
	Manufacturing
401	Primary metals products
402	Fabricated metals products
403	Computers and computing equipment
404	Nonelectrical machinery (including engines and turbines, construction machinery, metal working, and industrial machinery; and excluding computing and computing equipment)
	Electrical equipment
405	Household appliances (excluding radios and televisions)
406	Radios and televisions
407	Other electrical equipment (including electric motors, transmissions equipment, and generators)
	Transportation equipment
408	Aircraft, aircraft engines and parts
409	Motor vehicles and equipment
410	Guided missiles and space vehicles and parts
411	Other transportation equipment (including railroad and parts)
412	Ordnance (including arms manufacture and ammunition)
413	Professional and scientific instruments
414	Chemicals and allied products
415	Petroleum and coal products, including petroleum refining
416	Other manufacturing
417	**Construction**
	Mining and petroleum extraction
418	Coal mining
419	Petroleum and gas extraction
420	Other mining
	Transportation, communication, and utilities
421	Transportation
422	Communications
423	Utilities and sanitary services
	Wholesale and retail trade
424	Wholesale trade
425	Retail trade
426	**Finance, insurance, and real estate**
	Services
427	Computer and data processing services
428	Engineering, architectural, and surveying services
429	Other services
430	**Educational institutions**
431	**Uniformed military service**
	Government
432	Federal
433	State
434	Local
435	Other
436	**Other**

REFERENCE LIST C — OCCUPATIONS

This list is to be used in answering questions 15b and 25 about your occupational and professional classification. Please scan the entire list, choose the appropriate entry, and enter the code and description from this list. If you cannot find exactly the right entry, please choose the one that comes nearest to it. If none of the entries is at all appropriate, use the "Other" category (code 792) and enter a brief description in the space provided on the questionnaire. Note that codes 701—745 include college professors and instructors.

Engineers, including college professors and instructors

Code	Description
701	Engineer, aeronautical, aerospace, or astronautical
702	Engineer, agricultural
703	Engineer, chemical
704	Engineer, civil or architectural
705	Engineer, computer
706	Engineer, electrical or electronic
707	Engineer, environmental or sanitary
708	Engineer, industrial
709	Engineer, marine engineer or naval architect
710	Engineer, mechanical
711	Engineer, metallurgical or materials
712	Engineer, mining or geological
713	Engineer, nuclear
714	Engineer, petroleum
715	Engineer, sales
716	Engineer, systems
717	Engineer, other fields *(Describe briefly in the applicable item on questionnaire.)*

Computer Specialists, including college professors and instructors

Code	Description
718	Computer programmer
719	Computer scientist
720	Computer systems analyst
721	Other computer specialists *(Describe briefly in the applicable item on questionnaire.)*

Mathematicians, Statisticians and other Mathematical Scientists, including college professors and instructors

Code	Description
722	Actuary, including actuarial mathematician
723	Mathematician
724	Operations research analyst
725	Statistician
726	Systems analyst, except computer systems or data processing (see code 720)
727	Other mathematical scientists *(Describe briefly in the applicable item on questionnaire.)*

Physical Scientists, including college professors and instructors

Code	Description
728	Atmospheric scientist, meteorologist, space scientist
729	Chemist, except biochemist
730	Earth scientist, including geologist, geophysicist, geodesist, etc.
731	Oceanographer
732	Physicist, astronomer
733	Other physical scientists, e.g., geographer, environmental scientist, materials scientist, etc. *(Describe briefly in the applicable item on questionnaire.)*

Biological Scientists, including college professors and instructors

Code	Description
734	Agricultural scientist, food scientist, fishery biologist
735	Biochemist
736	Biological scientist, life scientist, botanist, ecologist
737	Biophysicist
738	Forestry or conservation scientist, including foresters and conservationists
739	Medical scientist, excluding persons who are primarily medical practitioners (see Health Occupations)
740	Other biological scientists *(Describe briefly in the applicable item on questionnaire.)*

Social Scientists, including college professors and instructors

Code	Description
741	Anthropologist
742	Economist, including market research analysts
743	Psychologist
744	Sociologist
745	Other social scientists, e.g., demographer, political scientist, etc. *(Describe briefly in the applicable item on questionnaire.)*

Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 739, Medical scientist.

Code	Description
746	Dental hygienist
747	Medical technician
748	Physician or surgeon
749	Other health occupations, e.g., dentist, pharmacist, practical and registered nurse, etc. *(Describe briefly in the applicable item on questionnaire.)*

Technicians and technologists, except medical and health

Code	Description
750	Designer, electronic parts
751	Designer, industrial
752	Designer, machine tools
753	Designer, other
754	Drafting occupations, including draftsman
755	Technician, architectural
756	Technician, biological and agricultural
757	Technician, construction and highway
758	Technician, electrical and electronic
759	Technician, industrial engineering
760	Technician, mechanical engineering
761	Technician, other engineering
762	Technician, surveying and mapping (Surveyors, see code 791)
763	Technician, other science
764	Technician, other fields *(Describe briefly in the applicable item on questionnaire.)*

Teachers

Code	Description
765	Teacher, elementary school
766	Teacher, secondary school
767	Teacher, college and university teacher of non-engineering and non-science subjects (Engineering and science teachers, see codes 701—745.)

Administrators, Managers, and Officials, excluding farm

Code	Description
768	Administrator or manager, production and operations
769	Administrator or manager, scientific and technical research and development
770	Administrator, manager, or official, all others, excluding self-employed
771	College president or dean
772	Self-employed proprietor
773	Urban and regional planners

All other occupations

Code	Description
774	Accountant, except financial analyst
775	Administrative support occupations, including clerical work (such as bookkeeper, secretary, etc.)
776	Architect
777	Clergy
778	Farmer (owner, manager, tenant, or farm laborer)
779	Financial analyst
780	Firefighter or police
781	Historian
782	Laborer, except farm
783	Lawyer or judge
784	Librarian
785	Merchant or shopkeeper, self-employed
786	Operator or fabricator (such as assembler, welder, truck driver, etc.)
787	Postal worker
788	Precision production, craft, and repair occupations (such as carpenter, electrician, mechanic, repair worker, etc.)
789	Sales occupations, excluding sales engineer
790	Social worker
791	Surveyor
792	Other occupations, not specified above *(Describe briefly in the applicable item on questionnaire.)*

☆U.S. GOVERNMENT PRINTING OFFICE:1986--646-042/[illegible]

STUDY #518-343-01
SPRING/SUMMER 1988

OMB No. 3145-0077
Expires: December 31, 1988

National Science Foundation
and
U.S. Department of Energy

1988 Survey of Natural and Social Science and Engineering Graduates

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries from which it will be impossible to identify any particular person. Your response is entirely voluntary and failure to provide some or all of the requested information will not in any way adversely affect you.

Conducted by:

Institute for Survey Research
Temple University
-Of the Commonwealth System of Higher Education-
Philadelphia, Pennsylvania 19122

INSTRUCTIONS FOR COMPLETING THIS QUESTIONNAIRE

In constructing this questionnaire, we have tried to provide response categories for most answers. If the response categories are not adequate for you to answer a question, please write in your answer.

For most questions, response categories have been provided and you are asked to mark a box. In addition, in some of the questions you are asked to fill in "code numbers" either from the list on the INSERT, or from a preceding question.

An example, with sample answers, is shown below.

• • • • •

1. Do you subscribe to any periodical journals or magazines?

   1. ☒ Yes *(GO TO QUESTION 2)*

   2. ☐ No *(SKIP TO NEXT SECTION)*

2. Which of the following journals or magazines do you receive? (MARK AS MANY AS APPLY)

01.	☒ Newsweek	04.	☒ Science
02.	☒ Time	05.	☐ Scientific American
03.	☐ Life	06.	☐ Other. SPECIFY: ____________

3. Which of the journals marked in question 2 most relates to the kind of work you do? (ENTER THE APPROPRIATE CODE NUMBER FROM QUESTION 2)

   0 4

• • • • •

Please answer all the questions that apply and follow directions which may ask you to skip certain questions. In the absence of instructions, always go to the next question. Even if you feel only part of the questionnaire applies to you, or there are some questions you cannot answer, please answer as many questions as possible and return the entire questionnaire.

We appreciate your participation and thank you for completing this questionnaire. Please go to the next page and answer all applicable questions.

PART I. EDUCATION

1. Please list all undergraduate and graduate degrees, **excluding** honorary degrees, that have been awarded to you. Refer to the DEGREE AND EMPLOYMENT SPECIALTY LIST on the INSERT for the degree field and code number of the major field. Do NOT include correspondence courses, on-the-job training, apprenticeships, or training at an employer's training school.

If you need more space, attach a separate sheet of paper and give the same type of information for each additional school listed.

1a. TYPE OF DEGREE	1b. MONTH/YEAR DEGREE GRANTED	1c. MAJOR FIELD (Enter degree field and code from DEGREE AND EMPLOYMENT SPECIALTY LIST on INSERT) Degree Field	Code	Honors*
Bachelor's	☐ ☐	☐	☐☐☐	☐
Master's	☐ ☐	☐	☐☐☐	☐
Doctorate	☐ ☐	☐	☐☐☐	☐
Other, (Specify): ______	☐ ☐	☐	☐☐☐	☐
Other (Specify): ______	☐ ☐	☐	☐☐☐	☐

*Mark Box if the degree conferred was with honors or distinction.

2. Between January and May 1988, did you attend a college or university?

1. ☐ Yes → 2. ☐ Undergraduate, full-time
   3. ☐ Undergraduate, part-time
   4. ☐ Graduate full-time
   5. ☐ Graduate, part-time
   → *(GO TO QUESTION 2a)*

6. ☐ No *(SKIP TO QUESTION 3)*

2a. What field of study did you pursue?
(ENTER DEGREE FIELD AND CODE FROM DEGREE AND EMPLOYMENT SPECIALTY LIST ON INSERT)

______________________ ☐☐☐

(DESCRIPTION OF DEGREE FIELD) (CODE)

☐ Did not pursue any specific field of study

PART II. EMPLOYMENT STATUS

3. During the week of April 3, 1988, were you:

1. ☐ Working full-time (35 hours or more at least in one position)
   (SKIP TO QUESTION 7)
2. ☐ Working part-time
   (GO TO QUESTION 4)
3. ☐ Not working, but seeking work
   (SKIP TO QUESTION 6a)
4. ☐ Not working and not seeking work
   SKIP TO QUESTION 5

4. Were you seeking full-time work?

1. ☐ Yes
2. ☐ No

→ *(SKIP TO QUESTION 7)*

5. Did you look for work at any time during the three weeks **prior** to the week of April 3, 1988, that is, between March 13 and April 2, 1988?

1. ☐ Yes 2. ☐ No

6. What was the **main** reason you were not working or not seeking work during the week of April 3, 1988? (MARK ONLY ONE BOX)

1. ☐ On layoff from a job
2. ☐ On vacation or otherwise temporarily absent from a job for health or personal reasons

→ *(GO TO QUESTION 7)*

3. ☐ Retired
4. ☐ Student
5. ☐ Family responsibilities
6. ☐ Chronic illness or permanent disability
7. ☐ Could not find work or believed no jobs available in my particular field
8. ☐ Did not want to work
9. ☐ New job to begin within 30 days
10. ☐ Waiting for school to begin
11. ☐ Other, PLEASE SPECIFY: ✎

____
____
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→ *(SKIP TO PART III ON PAGE 5)*

6a. If you were unemployed and seeking employment during the week of April 3, 1988, was your job search restricted by:
(MARK ONLY ONE BOX)

1. ☐ Geographic location
2. ☐ Family responsibilities
3. ☐ Need for part-time employment
4. ☐ Other, PLEASE SPECIFY: ✎ ______________________
5. ☐ Not restricted

→ *(SKIP TO PART III ON PAGE 5)*

7. During the week of April 3, 1988, were you working at (or on layoff or temporarily absent from) a position related to the natural sciences, social sciences, or engineering?

1. ☐ Yes *(SKIP TO PART III ON PAGE 5)*
2. ☐ No *(GO TO QUESTION 8)*

8. What was the most important reason that you were NOT working at a position related to science or engineering?
(MARK ONLY ONE BOX)

1. ☐ Preferred non-science or non-engineering position
2. ☐ Promoted out of science or engineering position
3. ☐ Pay was better in non-science or non-engineering position
4. ☐ Locational preference
5. ☐ Science or engineering position not available
6. ☐ Other reason, PLEASE SPECIFY: ✎

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PART III. EMPLOYMENT PROFILE

☐ If you have never been employed, nor self-employed, please mark this box and SKIP TO QUESTION ~~24~~ 26 ON PAGE 10. Otherwise, CONTINUE with the instructions below.

In this part of the questionnaire, we are asking questions about the job you held during the week of April 3, 1988, or your most recent job before April 3rd. Please include any employment, including a military service job, not only a scientific or technical job. If you had more than one regular job during the week of April 3rd, please list the one which you consider your principal employment.

9. For whom did you work? What is the name of the company, business, or the government agency you worked for?

________________________ CHECK HERE IF SELF-EMPLOYED ☐

9a. Where were you employed, that is, in what city, county, and state?

__________ (CITY OR TOWN) __________ (COUNTY) __________ (STATE OR FOREIGN COUNTRY)

10. Which of the categories below **best** describes the type of organization of your principal employment or post-doctoral appointment? (MARK ONLY ONE BOX)

01 ☐ Business or industry ➔ (GO TO QUESTION 10a)
02 ☐ Self-employed
03 ☐ Junior college, 2-year college, technical institute
04 ☐ Medical school
05 ☐ 4-year college or university, other than medical school
06 ☐ Elementary or secondary school system
07 ☐ Hospital or clinic
08 ☐ Nonprofit organization, other than hospital, clinic or educational institution
09 ☐ U.S. military service, active duty, or Commissioned Corps, such as USPHS, NOAA, etc.
10 ☐ U.S. Government, civilian employee
11 ☐ State government
12 ☐ Local or other government (SPECIFY): __________
13 ☐ International agency
14 ☐ Other (SPECIFY): __________

➔ *(SKIP TO QUESTION 11)*

10a. How would you classify the organization for which your work?

(PLEASE ENTER CODE FROM EMPLOYER CLASSIFICATION LIST ON THE INSERT. IF THE ORGANIZATION CONDUCTS ITS ACTIVITIES AT DIFFERENT LOCATIONS, ENTER THE CODE FOR THE ACTIVITY AT THE LOCATION WHERE YOU ARE EMPLOYED. PLEASE WRITE IN THE TYPE OF ACTIVITY IF IT IS NOT FOUND ON THE LIST.)

☐☐☐ (CODE) TYPE OF ACTIVITY: __________

11. If you had more than one job during the week of April 3, 1988, enter the category from the above list that is most appropriate for your **second** job.

(ENTER THE APPROPRIATE CODE NUMBER, 01-14, FROM QUESTION 10 ABOVE)

☐☐ (CODE) ☐ Did not have a second job the week of April 3, 1988.

12. From the activities listed below, select your primary and secondary work activities for your principal job (as reported in question 9) in terms of time devoted for a typical week.

(ENTER THE APPROPRIATE CODE NUMBER 01-16 FOR EACH)

☐☐ Primary activity ☐☐ Secondary Activity

01 Management or administration of research or development
02 Management or administration of other than research and development
03 Teaching and training—preparing and teaching courses, guiding and counseling students or trainees
04 Basic research—that is, study directed toward gaining scientific knowledge primarily for its own sake
05 Applied research—that is, study directed toward gaining scientific knowledge in an effort to meet a recognized need
06 Development—product, process, and technical development. That is, direction of knowledge gained from research toward production of useful materials, devices, systems and methods
07 Report and technical writing, editing, information retrieval
08 Clinical diagnosis, psychotherapy
09 Design of equipment, processes, models
10 Quality control, testing, evaluation, or inspection
11 Operations—production, maintenance, construction, installation, exploration
12 Distribution—sales, traffic, purchasing, customer and public relations
13 Statistical work—survey work, forecasting, statistical analysis
14 Consulting
15 Computer applications
16 Other activities (SPECIFY): __________

13. During a typical week in your principal job (as reported in question 9), what percent of working time do you devote to the following activities?

(ENTRIES SHOULD TOTAL 100.0%)

______% Primary work activity
______% Secondary work activity
______% Other activities
100.0% TOTAL

14. From the DEGREE AND EMPLOYMENT LIST on the INSERT, select and enter the number and title of the specialty most closely related to your principal employment (as reported in question 9) during the week of April 3, 1988.

(PLEASE WRITE IN YOUR SPECIALTY IF IT IS NOT ON THE LIST)

Number: ☐☐☐
Title: __________

15. For your principal job (as reported in question 9), what is the basic annual salary you **currently** earn?

(Do **not** include bonuses, overtime, summer teaching or other payments for secondary jobs.)

$ ________________.00 per year

☐ Not currently employed at that job.

16. If academically employed in your principal job, is your salary for:

☐ 9-10 months, OR ☐ 11-12 months?

☐ Not Academically employed.

17. How many years of professional work experience, including teaching, do you have?

__________ Year(s) OR ☐ None

18. Using the DEGREE AND EMPLOYMENT SPECIALTY LIST on the INSERT, complete the following statement:

"Based on my total education and experience, I regard myself professionally as a(an)...

______________________________________."

CODE: ☐☐☐

19. During the week of April 3, 1988, was any of your work at your principal job supported by U.S. Government funds?

1. ☐ Yes → *(GO TO QUESTION 20)*
2. ☐ No
3. ☐ Don't know

→ *(SKIP TO QUESTION 21)*

20. Which of the following agencies or departments were supporting your work?

(MARK AS MANY AS APPLY)

1. ☐ AID—Agency for International Development
2. ☐ Department of Agriculture
3. ☐ Department of Commerce
4. ☐ Department of Defense
5. ☐ Department of Energy
6. ☐ Department of Education (NIE, OE, CES)
7. ☐ Department of Health and Human Services (DHHS—old HEW)
8. ☐ Department of Housing and Urban Development
9. ☐ Department of the Interior
10. ☐ Department of Justice
11. ☐ Department of Labor
12. ☐ Department of Transportation
13. ☐ EPA—Environmental Protection Agency
14. ☐ NASA—National Aeronautics and Space Administration
15. ☐ NSF—National Science Foundation
16. ☐ Nuclear Regulatory Commission
17. ☐ Other, SPECIFY:

____

____

____

18. ☐ Don't know source agency

21. The following list contains selected areas of national interest. Indicate the **one** area to which you devote(d) the **most** professional time during a typical week at the job reported in question 9.

1. ☐ Energy and fuel (GO TO QUESTION 22)
2. ☐ Health
3. ☐ Environment
4. ☐ Education
5. ☐ National defense
6. ☐ Agriculture
7. ☐ Mineral resources
8. ☐ Community development and service
9. ☐ Housing (planning, design, construction)
10. ☐ Transportation
11. ☐ Communications
12. ☐ Technological development
13. ☐ Space
14. ☐ Other, PLEASE SPECIFY:

____

____

→ *(SKIP TO QUESTION 26)*

22. What is your best estimate of the percent of your professional time that you devote(d) to **energy and fuel** during a typical week?

1. ☐ 100 percent
2. ☐ 75 to 99 percent
3. ☐ 50 to 74 percent
4. ☐ 25 to 49 percent
5. ☐ 24 percent or less

23. From the list below, indicate the **one** energy source that involves(d) the **largest** proportion of your energy-related work during a typical week.

1. ☐ Coal and coal products
2. ☐ Petroleum (including oil shale and tar sands) or natural gas
3. ☐ Fission
4. ☐ Fusion
5. ☐ Hydroenergy
6. ☐ Direct solar (including space and water heating, thermal, electric)
7. ☐ Indirect solar (winds, tides, biomass, etc.)
8. ☐ Geothermal
9. ☐ Other, SPECIFY: ______________________________

____

24. From the list of energy-related activities below, indicate the items that best describe the activities in which you were engaged during a typical week.

(MARK AS MANY AS APPLY)

1. ☐ Exploration
2. ☐ Extraction (gas, oil, mining)
3. ☐ Manufacture of energy-related components or products
4. ☐ Fuel processing (including refining and enriching)
5. ☐ Electric power generation
6. ☐ Transportation, transmission, distribution of fuel or energy
7. ☐ Energy storage
8. ☐ Energy utilization, management
9. ☐ Fuel reprocessing or disposal
10. ☐ Energy conservation
11. ☐ Environmental impact (health, economic, etc.)
12. ☐ Education, training
13. ☐ Other, SPECIFY: ______________________________

____

25. From the list in question 24, enter the number of the activity that best describes the one in which you spend(t) most of your energy-related time.

(ENTER THE APPROPRIATE CODE NUMBER, 01-13, FROM QUESTION 24)

☐☐

(CODE)

PART IV. DEMOGRAPHIC CHARACTERISTICS

26. In what month and year were you born?

__________ (MONTH) __________ (YEAR)

26a. Where was your place of birth?

____________________ (STATE, OR FOREIGN COUNTRY, IF NOT USA)

27. Are you:

1. ☐ Male 2. ☐ Female

28. Are you:

1. ☐ U.S. citizen
2. ☐ U.S. naturalized
→ *(SKIP TO QUESTION 29)*
3. ☐ Non-U.S. immigrant (Permanent Resident)
4. ☐ Non-U.S. citizen, nonimmigrant (Temporary Resident)

28a. IF non-U.S. citizen, of which country are you a citizen?

____________________ (COUNTRY)

29. Are you:

1. ☐ American Indian or Alaskan Native
2. ☐ Asian or Pacific Islander
3. ☐ Black
4. ☐ White
5. ☐ Other, PLEASE SPECIFY: →

____

____

____

____

____

____

29a. Are you of Spanish/Hispanic origin or descent?

1. ☐ Yes → 2. ☐ Mexican-American
3. ☐ Puerto Rican
4. ☐ Other Hispanic
5. ☐ No

30. As of April 3, 1988, were you:

1. ☐ Married 2. ☐ Widowed
3. ☐ Separated 4. ☐ Divorced
5. ☐ Never married

31. As of April 3, 1988, did you have any children living with you?

1. ☐ Yes → 2. ☐ Under 6 years of age
3. ☐ 6-17 years of age
4. ☐ No

32. Are you physically disabled?

1. ☐ Yes *(GO TO QUESTION 33)*
2. ☐ No *(SKIP TO QUESTION 34)*

33. What is the nature of your disability(ies)?

(MARK AS MANY AS APPLY)

1. ☐ Visual
2. ☐ Ambulatory
4. ☐ Auditory
8. ☐ Other, SPECIFY: →

____

PART V. OTHER INFORMATION

34. So that we can contact you in the event it is necessary to clarify some of the information you provide, please give us your first name and the telephone number at which you can be reached.

____________________ (FIRST NAME)

__________ (AREA CODE) ________________ (NUMBER)

If there is an alternate number at which you can be reached, enter it also.

__________ (AREA CODE) ________________ (NUMBER)

35. Date completed:

__________ (MONTH) __________ (DAY) __________ (YEAR)

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. PLEASE RETURN THE COMPLETED FORM IN THE ENCLOSED POSTAGE-PAID ENVELOPE TO:

INSTITUTE FOR SURVEY RESEARCH
TEMPLE UNIVERSITY—083-46
1601 NORTH BROAD STREET
PHILADELPHIA, PA 19122

DEGREE AND EMPLOYMENT SPECIALTY LIST

Agriculture

804	Agriculture, business
013	Agronomy
014	Animal, dairy, poultry sciences
015	Farm and range management
016	Fish, game, and wildlife management
017	Food sciences
018	Forestry and related sciences
019	Horticulture
020	Natural resources management
021	Soil science
090	Agricultural sciences, other*

Biological Sciences

211	Anatomy, histology
213	Biochemistry
714	Biometrics and biostatistics
214	Biophysics
215	Botany
221	Cell and molecular biology
216	Entomology
226	Embryology
217	Genetics
218	Immunology
219	Marine biology
220	Microbiology, bacteriology
227	Neurosciences
222	Nutrition
228	Parasitology
223	Pathology, human, animal, plant
224	Physiology, human, animal, plant
229	Radiology
230	Toxicology
225	Zoology
290	Biological sciences, other*

Education

413	Biological sciences education
414	Engineering education
417	Mathematics education
421	Physical sciences education
425	Social science education
490	Education, other*

Engineering

511	Aerospace, aeronautical, astronautical
512	Agricultural
513	Architectural
514	Bioengineering and biomedical engineering
515	Chemical, including petroleum refining
516	Civil, construction, and transportation
729	Computer
517	Electrical, electronic, and communication
529	Engineering science, mechanics, physics
519	Environmental and sanitary
520	Geological
521	Industrial
530	Materials
522	Mechanical
523	Metallurgical
524	Mining and mineral
525	Naval architecture and marine
526	Nuclear
531	Ocean
527	Petroleum
528	Textile
751	Operations research/management sciences
590	Engineering, other*

Mathematical Sciences

711	Actuarial science
712	Applied mathematics
750	Mathematics
751	Operations research/management sciences
713	Statistics
714	Biometrics and biostatistics
780	Mathematics, other*

Computer and Information Sciences

723	Software systems
724	Hardware systems
725	Intelligent systems
726	Information sciences
727	Systems analysis
728	Computer sciences, other*

Physical Sciences

720	Astronomy
721	Atmospheric sciences and meteorology
213	Biochemistry
722	Chemistry
741	Earth sciences and geology
733	Metallurgy
742	Oceanography
731	Physics
790	Physical sciences, other*

Social Sciences

811	Anthropology
812	Criminology
813	Economics (except agricultural)
814	Geography
815	Economics, agriculture
118	Linguistics
817	Political science and government
818	Psychology (except clinical)
821	Sociology
822	Urban studies
890	Social sciences, other*

Health Sciences

611	Clinical psychology
612	Dentistry
614	Hospital and health care administration
615	Medicine or premedicine
616	Nursing
617	Pharmacology
618	Pharmacy
690	Health area, other*

Arts, Humanities and Other Specialties

910	Area and ethnic studies
911	Architecture and environmental design
110	Arts and letters, general
310	Business and commerce
115	English and journalism
114	Fine and applied arts
116	Foreign language and literature, all fields
815	History
912	Home economics, all fields
913	Law and prelaw
914	Library science
915	Military science, including merchant marine deck officer
816	Philosophy
819	Religion and theology
820	Social work
999	Other specialities*

*Identify specific field in space provided in the questionnaire.

EMPLOYER CLASSIFICATION LIST

CODE	
	Manufacturing
401	Primary metals products
402	Fabricated metals products
403	Computers and computing equipment
404	Nonelectrical machinery (including engines and turbines, construction machinery, metal working and industrial machinery; and excluding computing and computing equipment)
	Electrical Equipment
405	Household appliances (excluding radios and televisions)
406	Radios and televisions
407	Other electrical equipment (including electric motors, transmission equipment, and generators)*
	Transportation Equipment
408	Aircraft, aircraft engine and parts
409	Motor vehicles and equipment
410	Guided missiles and space vehicles and parts
411	Other transportation equipment (including railroad and parts)*
412	Ordnance (including arms manufacture and ammunition)
413	Professional and scientific instruments
414	Chemicals and allied products
415	Petroleum and coal products, including petroleum refining
416	Other manufacturing*
417	**Construction**

CODE	
	Mining and Petroleum Extraction
418	Coal mining
419	Petroleum and gas extraction
420	Other mining*
	Transportation, Communications, and Utilities
421	Transportation
422	Communications
423	Utilities and sanitary services
	Wholesale and Retail Trade
424	Wholesale trade
425	Retail trade
426	Finance, Insurance, and Real Estate Services
427	Computer and data processing services
428	Engineering, architectural, and surveying services
429	Other services*
430	**Other***

* Identify specific industry in space provided in the questionnaire.